

CIO

The Magazine for Information Executives

AMERICAN AIRLINES
GETS PERSONAL

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IS ETHICAL
BUSINESS AN
OXYMORON?

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SPECIAL REPORT:
E-BUSINESS STRATEGIES
Including:

The Best Company
in the World Starts Over

Dotcom Repellent—
Take Back Your Market

Channel Alchemy—
Getting Seamless

BURNING down the House

GE CIO Gary Reiner

PAGE 88



What if the baseball could

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repair the window?

fitting it should also provide the solution.

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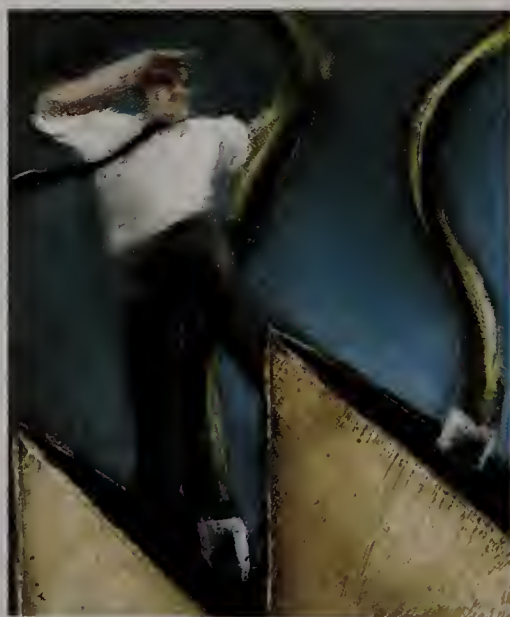
By Meridith Levinson

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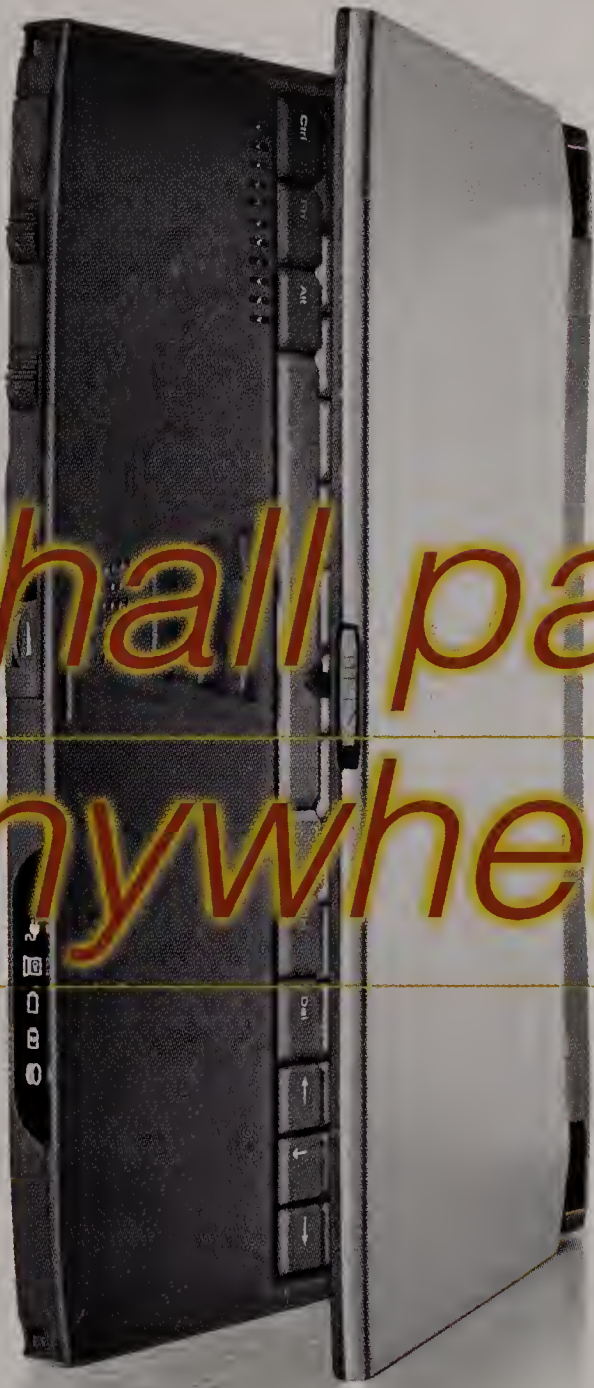


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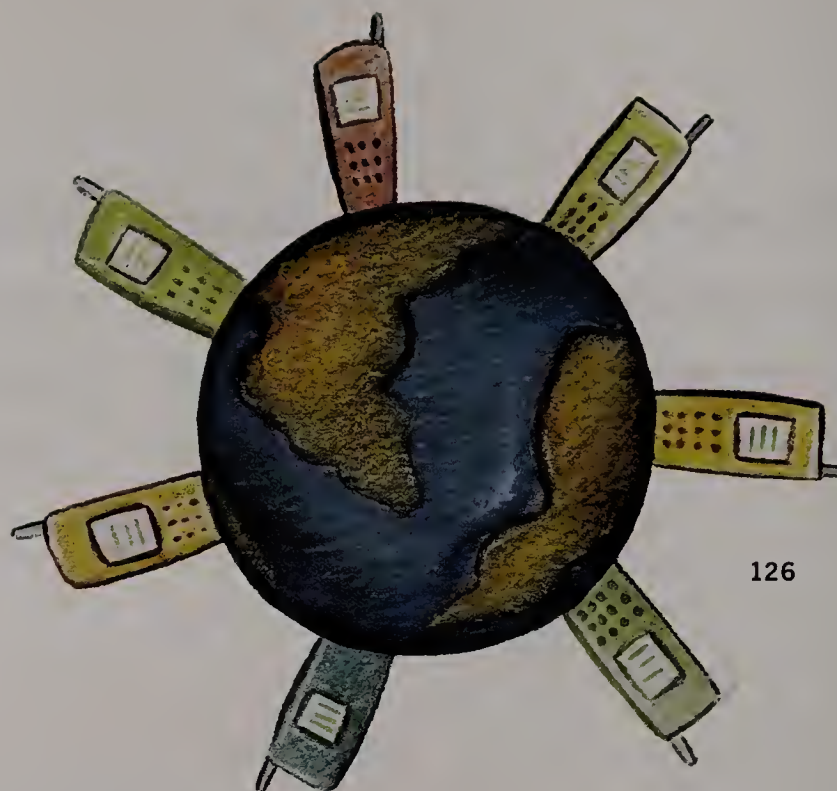
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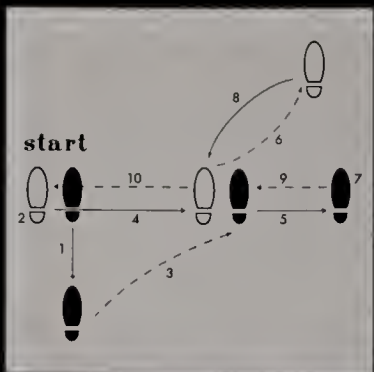
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Diagrams work.

But, face it,
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Opinion Online

Rob Neville on e-CRM

ASK THE EXPERT From July 15 to July 31, Rob Neville, cofounder and co-CEO of Evity will answer your questions about online customer relationship management. www.cio.com/CIO/expert

Marla Grossman on high-tech companies and Capitol Hill

CIO RADIO Marla Grossman, federal affairs director at Verner, Lipfert, Bernhard, McPherson and Hand, discusses the public relations benefits that can come to high-tech companies that join forces with the government. (Coming July 19) www.cio.com/radio

Mark Polansky on executive career issues

EXECUTIVE CAREER COUNSELOR How can I move from the public sector to the private? When do I know that it's time to move on? Korn/Ferry International's Mark Polansky is on call to answer your toughest executive IT career questions. www.cio.com/forums/executive/counselor.html



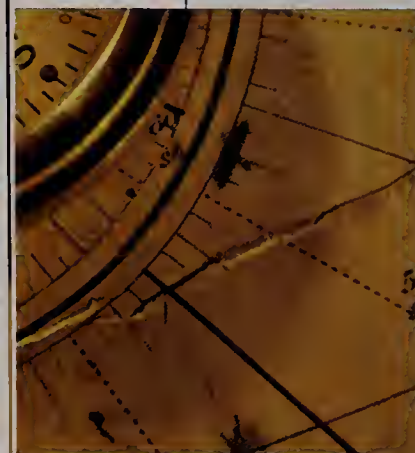
AND DON'T MISS...

Quick Poll

How often do you update your desktop hardware? Do you outsource your VPN? Use this real-time poll to learn what your peers are thinking and doing. www.cio.com/poll

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NEW THIS >> MONTH

RATE THE STARTUP

WebBusiness's interactive examination of some promising (and less-than-promising) dotcom startups. Each month, we present a company's "elevator pitch," describing its human capital, venture funding, customers, business model and competition. After allowing you to peek behind the company's walls, we ask you to rate the company's chances for success. Industry experts offer their own ratings, which you can view after you submit yours. webbusiness.cio.com/startup

“In the FAST-MOVING world of technology, the risks of being CAUTIOUS are very high.”

—William Fulmer, author of *Shaping the Adaptive Organization* (Amacom, 2000), on “Ask the Author” in the CIO Reading Room. www.cio.com/books

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From the Editor

lundberg@cio.com

Round 2: Who Are You?

In the battle between the dotcoms and the notcoms, things are starting to get interesting. In Round 1, the dotcoms were doing so many new and fascinating things—and there was so much unbridled hype around them—that the old guard fell into something of a panic. This produced opportunities for consulting companies that has made the reengineering gold rush look quaint by comparison, and it put tremendous pressure on CEOs and CIOs alike to deliver or get out of the way.

But the cold shower of this spring's shakeout in dotcom financing and valuation has provided the opening old-economy companies needed to slow their heart rates and start thinking clearly. The fact that profits do indeed matter has helped executives ratchet up their courage and ask, In the new economy, who are we? (Or: Given our fundamental value proposition, what combination of products, services, relationships and channels will help us prevail in the technology-enabled world?)

Our special report on e-business strategies, beginning on Page 88, showcases the thinking of both well-established players and the upstarts at this point of business evolution.



In “Destructive Behavior” on Page 90, Staff Writer Meridith Levinson goes inside GE to look at how Jack Welch and his lieutenants, including CIO Gary Reiner, went about destroying their businesses (through simulation exercises) in order to save them. The lesson: You really can teach an old dog new tricks. (Or can you? Do you think GE really gets it? I’d love to know what you think.)

“Brick Slayers” (Page 100) brings together a collection of folks you’d just love to have at a dinner party—both old- and new-economy IT leaders, along with a couple of very sharp industry observers. While some of the comments of the established players sound a bit defensive, it’s clear these companies are focused on the threats, challenges and opportunities they should be paying attention to in the months ahead. Levinson’s profile of Simon Property Group (Page 114)—a mall developer that’s radically revamping its business model—is a great example of how far from the past one can get by asking “Who are we?”

Has your company begun this line of inquiry? Have you learned anything surprising? Let us and your fellow CIO soul-searchers know by sending me an e-mail to *lundberg@cio.com*.

Albi Lundberg

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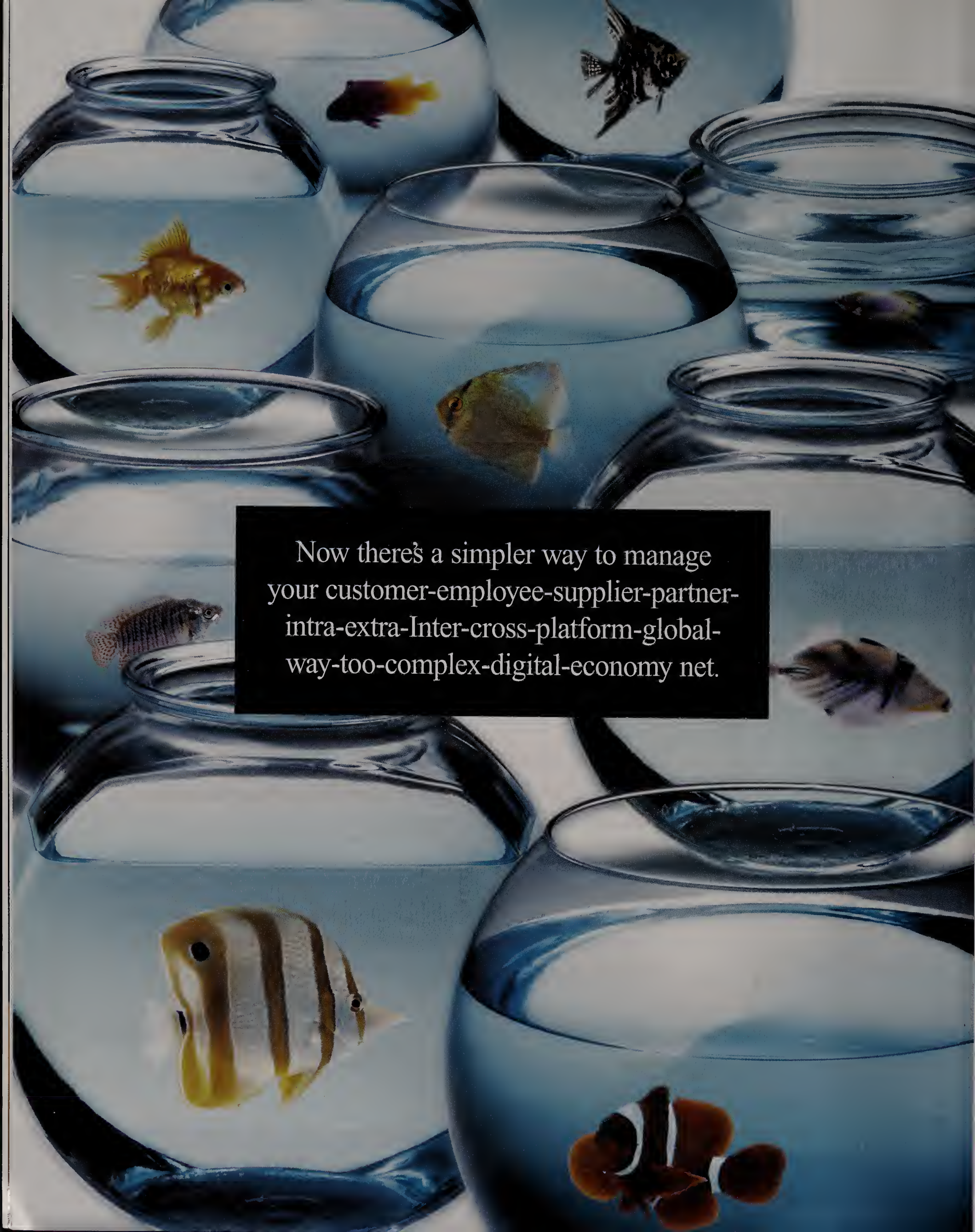
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A collage of various fish in glass bowls. The fish include a goldfish, a betta fish, a platyfish, a guppy, a zebra fish, a striped fish, and a clownfish. The bowls are arranged in a way that they overlap, creating a sense of depth and complexity.

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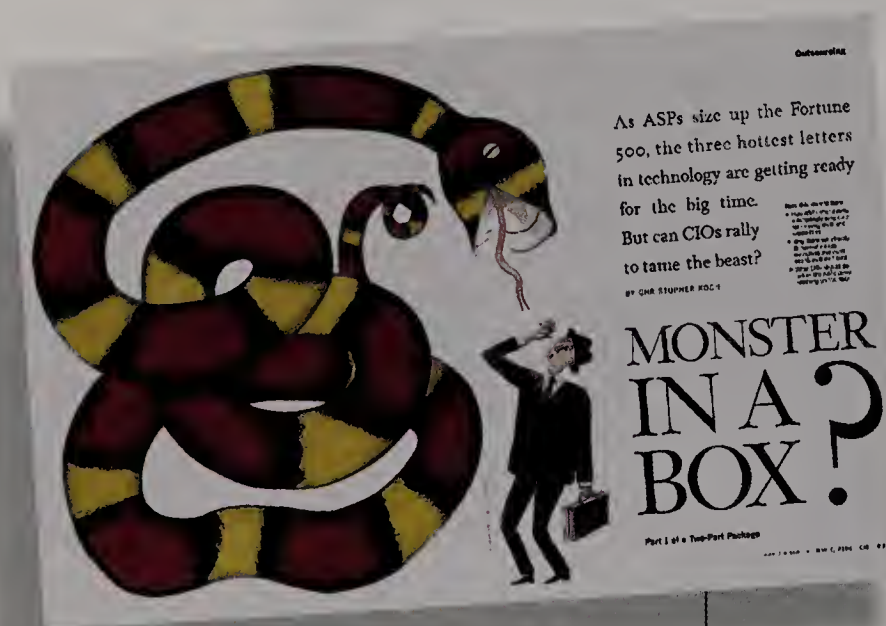
Reader Feedback

MICROSOFT NOT A MONOPOLY

I enjoyed your comments about Microsoft ["Innovate or Separate," *CIO*, May 15, 2000]. The amazing thing about all of the hype is that I have a choice in whether to use the bundled software that we all hear about, but nothing in the Windows environment has kept me from using my Lotus Notes, Netscape, AOL and other products. In fact, my 53-employee sales group is using the same packages, and we are doing fine. Where is the real monopoly? I can't seem to find it.

What we have purchased is an operating system that is simple, easy to use and consistent across all of these applications. We as consumers got what we wanted and paid what I think is a reasonable price. Would someone tell me why Judge Jackson and our government are spending millions of dollars to spank a successful corporation? Your 24-month proposal sounds reasonable to me.

Gary Carson • Director of Sales • Plainfield, Ill.



SMALL I.T. SHOPS AND ASPs

I enjoyed your article on ASPs ["Monster in a Box," *CIO*, May 1, 2000]. It was the most realistic and well-rounded discussion I've seen yet on the topic.

Being the head of IT for a midsize company, I have a unique and (in my opinion) often overlooked perspective. You said in your article that one advantage of ASPs is the cost savings and another is the ability of companies such as mine to implement solutions that they never could have dreamed of own-

ing outright. Both statements are true, but there's an incongruity between the two: For a company such as ours, implementing an advanced solution through an ASP will give us a better solution at a significant cost increase, and the challenge is justifying that increase.

For example, we're considering using an ASP for a full-service HR management system, such as PeopleSoft, SAP or Lawson. However, based on initial conversations with these companies, it's apparent that the annual cost of this ASP arrangement could easily exceed our entire current annual IT budget. As another example, we currently have approximately one-quarter to one-half of one IT associate dedicated to maintaining our Exchange/Outlook e-mail system. I've spoken to ASPs that offer full Exchange hosting services, but these services would cost us nearly

double what it currently costs to host in-house.

The primary reason for these incongruities is that—as a small IT shop with no CIO—we simply can't afford to dot every "i" and cross every "t," unlike most IT shops at larger, more established companies. As a result, our IT department has to cut corners and use a lot of seat-of-the-pants management techniques to keep the business running. (I'd be willing to bet that the vast majority of small to midsize companies and their IT shops are in similar situations.) Of course, the ASPs don't have the luxury of cutting corners, and this is both good and bad. It's good because you know they're handling the details that might otherwise keep you awake at night; it's bad because management too often looks at the increased costs and decides that they would rather live with the seat-of-the-pants approach and all the associated risks than pay for the more professional and reliable management that an ASP would bring.

I've had many ASPs tell me that their primary target audience consists of small to midsize companies just like ours. However, I haven't yet heard a sales pitch that's compelling enough to move typical upper-management types past the initial sticker shock. To me, that's the rub: In order for ASPs to tap into this huge pool of potential customers, they must develop effective ROI-based arguments for those who approve the budgets, and in small to midsize companies that's usually the CEO and CFO.

I believe ASPs have the opportunity to make a huge difference in the world of IT because they are in a unique

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position to collectively establish widely published benchmarks for the true total cost of ownership numbers for large applications such as financials and ERP. I believe in the long run this will be a good thing, as it will provide consistent, well-established financial baselines for information technology directors and upper management alike to consider as they look toward implementing advanced solutions or potential ASP relationships.

David Reid
Director of IT
Fazoli's Restaurants
Lexington, Ky.
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CIOs and CTOs need to focus on solving business problems with the right technology—and not limiting themselves to finding ways for the company to use the latest technology tool.

CTOS: A USER'S OPINION

I'm responding to your recent article on CTOs ["The Wolf at the Door," *CIO*, May 15, 2000]. I am probably an odd recipient of *CIO*. I am a user, not an IS person. My primary responsibility is to act as the functional architect for our claim administration systems. I manage a team of senior business analysts who work with our IS staff to keep our systems state of the art.

I want to offer my opinion that the success rate of CTOs isn't going to be much better than that of CIOs, since both approach business needs from the technology side. What they should do is approach technology from the business side.

Let me state that another way. The focus from the IS side seems to lean

toward identifying the leading-edge technology and then finding a business use. They might even try to force-fit the technology to the business need. I'm not saying that the approach won't work but that the user must then accept the solution. And the bottom line may only affect technology with little significant impact on the business.

We need CIOs and CTOs who will focus on solving the business needs without a preconceived technology in mind. Not every business need lends itself to e-business. GUI screens are not the solution for high-volume, transaction-driven businesses, such as the health insurance business I'm in.

Granted, I might find it useful to be able to check on a pending claim via the Internet or to order a new ID card for my child who's heading off to school in another city. But if the CIO or CTO suggests we ought to have the Internet do this or that because someone like me might use it, that may not be the best use of resources. The company might spend money on it and it might prove successful. On the other hand, the company would be better off solving its most critical business problems by finding the right technology.

The bottom line is that CIOs and CTOs need to focus on solving business problems with the right technology—and not limiting themselves to finding ways for the company to use the latest technology tool.

But then again, I am a user. What do I know?

Rudy Schmitz
Executive Director for Claim Support
General American Life Insurance Co.
St. Louis
rschmitz@genam.com

STUDENT AIDS

As a headhunter, I enjoyed your article on the Sloan students ["Sitting on Top of the World," *CIO*, May 15, 2000]. I meet with so many clients, venture capitalists and incubators who tell me they want an MBA with Big Five experience who is 27 or younger and is able to leap tall beers.

I walk away from those clients.

Your piece showed the diversity of the best and brightest on the East Coast. Even if these people are schooled in an institution, they all do not come out looking and smelling the same. I was impressed by the students you met. The reason I love my job is because I meet and interview these types of people all day long for various CTO, CIO and COO roles.

Jeff Kronisch
Account Executive
RHI Consulting, a division of Robert
Half International
New York City
jeffrey.kronisch@rhic.com

CORRECTION

In our June 1, 2000, cover story, "Pro and Con," we misspelled the name of a password-cracking program. L0pht-Crack is a proprietary program created by L0pht Heavy Industries, an R&D group of Cambridge, Mass.-based e-commerce security company @Stake.

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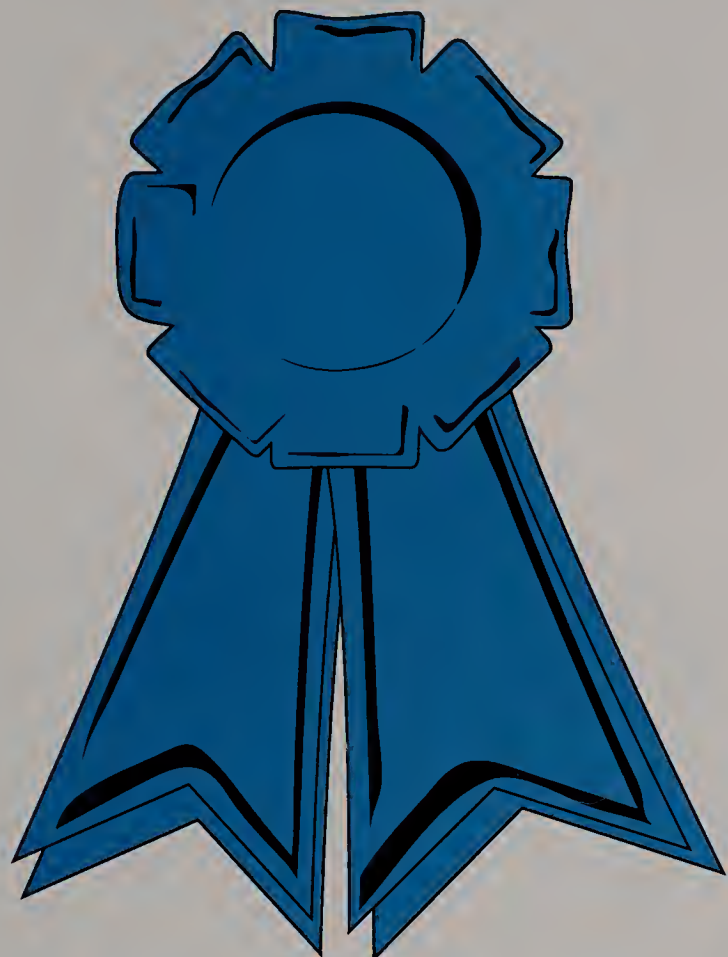


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Edited by Sandy Kendall

D A T A M A N A G E M E N T

IT to Pump You Up

By Matt Villano

YOU MIGHT EXPECT the gym, a place of clanking iron plates and mind-numbing treadmills, to be the last holdout against IT infiltration. But just step into New York City's Asphalt Green fitness center to shatter that notion: Every machine on its main workout floor has a tiny hard drive and a computer screen on which fitness freaks can track their workouts. The machines are connected to a local area network so that club members can take their workout records with them effortlessly as they move from station to station, updating data with every rep.

Asphalt Green's system is the brainchild of Stamford, Conn.-based FitLinxx Inc. (www.fitlinxx.com). More than 200 gyms in cities around the country have the system too, joining what Jay Hartley, FitLinxx vice president of software development, calls a revolution in "techno-exercise." For a monthly fee, FitLinxx technicians outfit health clubs' weight-training and cardio-

vascular equipment with new hardware and software and are on-call for service. The technology guides club members through their workout regimes, suggesting weight or resistance levels, recording performance and generally overseeing their fitness programs. Every member has a personal ID number that tells a machine who is using it.

"We like to think that we extend [the services of] the personal trainer you may not have access to all the time," says Hartley, who started his IT career in financial services.

While FitLinxx may be a leader, it's only one of a multitude of IT companies now revolutionizing the ordinary workout. San Francisco-based Netpulse Communications (www.netpulse.net), for example, takes a



different tack. Rather than manage and record your workout data, its products let you multitask while working out. Netpulse replaces the standard display screen on cardiovascular equipment with a 15-inch screen that, once connected to a local server, lets you surf the Web or exchange e-mail. E-Zone (www.ezonenetworks.com) of Napa, Calif., offers "personal entertainment systems"; fitness enthusiasts can either plug into motivational or instructional workout programs or listen to compact discs or watch TV while burning calories.

"Fitness companies have moved way beyond the golf pencil and the workout card," observes Thomas Proulx, Netpulse's CEO. "Anyone in the industry will tell you that the future of fitness is IT."

Department of **BIG,** Scary Numbers

8%: PORTION of 1999 e-commerce that was business to business **\$150** billion: total value of B2B e-commerce sales in 1999 **\$3** trillion: projected total value of B2B e-commerce sales by 2003 **233%:** average increase in stock price of Internet companies at IPO in 1999 Sources: *The Economist*, Feb. 26, 2000, The Internet Index.



OUT IN THE Open

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tradition
meets
technology

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Unisys and the Royal and Ancient Golf Club of St. Andrews have forged a unique partnership to develop the most sophisticated and capable of computerized scoring information systems.

A FINE Match

ARGUABLY THE MOST traditional and precise of all sports, golf has changed remarkably little in its 600-year history. The object of the game remains to hit a little ball up to a quarter of a mile past, around, and over numerous obstacles and hazards, and have it roll into a small hole dug into the earth.

The very essence of this tradition and precision unfolds at the oldest of golf championships, the British Open, where the world's finest golfers tee off this summer from the exact same turf at St. Andrews in Scotland where golfballs first took flight in the early 1400s.

While thousands of spectators jam the wind-swept links to watch the golf masters at work, millions more around the world follow the action on television and, increasingly, on the Web. And owing to another partnership steeped in a tradition of excellence and precision, all these fans can track the scores and standings of their favorite golfers within seconds of a ball dropping into any of the notorious holes at St. Andrews' Old Course.



"They've given us and the media a simple-to-use system that allows users to extract very complex information very quickly. I know what they are doing is anything but simple, yet they make it look easy."

Stewart McDougall, press officer of The Open Golf Championship

With more than 20 years together, Unisys and the Royal and Ancient Golf Club of St. Andrews have forged a unique partnership to develop the most sophisticated and capable of computerized scoring information systems. With scoring updates sent in

real time to major media outlets for processing in a variety of applications, the scoring system is an expression of leading-edge, mission-critical, fault-tolerant computing in support of tradition and individual excellence.

"This will be our 21st year with the

Royal and Ancient Golf Club," says David Fox, manager of the Global Sports Marketing Program for Unisys, "and we are providing scoring data and data-crunching applications to major media including the BBC, ABC, ESPN, Japan's TV Ashai, and BBC Radio. In addition to the British Open, Unisys provides the scoring information system for a second Grand Slam golf event, the U.S. Open, as well as for the U.S. Women's Open, the U.S. Amateur, all the European PGA Tour events, the Australian Tour, and the World Amateur Championship, making Unisys the world's premier enterprise solution provider for major golf events."

"Unisys adds huge value to us and to our work," notes Barbara Slater, executive producer with the British Broadcasting Corporation (BBC), who has covered The Open since 1984. The BBC is among the largest users of Unisys scoring data. "They have always worked to understand what we are trying to do. It's a real partnership we have with them and, as a result, we've progressed together."

Bringing You The Wind

Television production teams constantly strive to enhance their viewers' enjoyment and understanding of sports events. That often means attempting to show the viewers just what the players are experiencing. In championship golf, shifting wind conditions have spelled boom and bust for countless golfers.

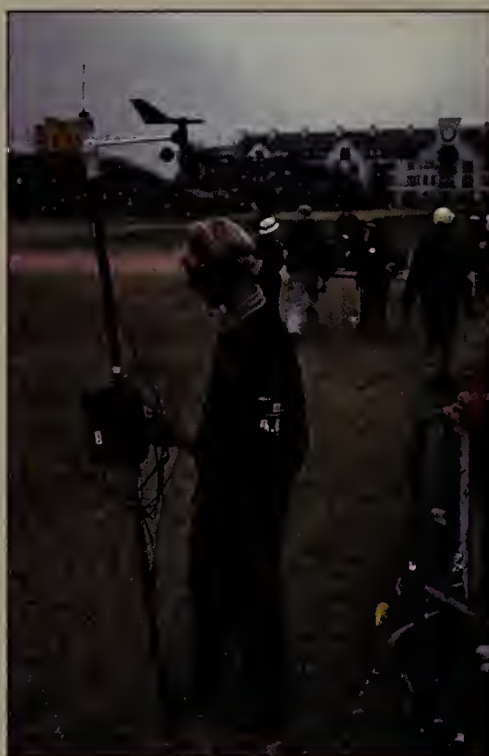
Until recently, swirling tree branches and the muffled sound of gusts beating against microphones were the only clues the television audience had for gauging wind conditions on the course.

Thus, a couple years ago, ABC Sports presented Unisys with a challenge: Develop technology to allow TV viewers to "see" the wind.

The result is the "wind stick," a fully portable, telescoping telemetry station, extendable to 18 feet and consisting of a precision anemometer and a wind vane. Into a lunchbox-sized, weatherproof case, Unisys packaged a micro-controller, radio modem, battery, and custom-designed interface card that connects the instruments to the components, while providing a simple operator interface.

Running custom software developed by Unisys, the micro-controller samples the instruments, calculates wind speed and direction, and feeds the data via modem to a base-station PC.

Other Unisys software merges the wind telemetry data with graphics software, producing, at the director's command, the now-common ABC sports graphic. (The BBC has also begun using this innovative system.) The portable nature of the wind stick allows operators to move with a group of golfers and to sample fickle winds at different points of the hole, such as at the tee or at an elevated green.



The wind stick dramatizes gusts on the greens.

BEHIND THE CURTAIN

Slater's staff and some 400 other journalists and media broadcasters spend much of their time at the Media Center, run by "event CIO" Stewart McDougall, press officer of The Open Golf Championship. Echoing Slater's experience working with Unisys, McDougall says, "They've given us and the media a simple-to-use system that allows users to extract very complex information very quickly. I know what they are doing is anything but simple, yet they make it look easy."

The scoring system is a master-

work of ingenuity that is flexible enough to evolve with the rapidly changing needs of the media and of the golf-watching public. For example, in the United Kingdom, the majority of BBC television viewers of

system gathers throughout The Open?

The action starts right at greenside. The moment a player's putt drops in the hole, a greenside scorer enters the play data into a handheld terminal. The information is instantly radioed to the Unisys data-center-on-wheels on the course grounds. Servers there immediately enter the score and feed the information to the hundreds of media at work in the Media Center and in the separate booths and trailers of the BBC, ABC, and others. Servers also instantly update various Web sites, including The Open's own site, www.opengolf.com.

All this occurs by the time the golfer has tipped his hat to the crowd and stooped over to retrieve his ball.

Unisys recognized early on the heady challenge of building a fault-tolerant system, given

the temporary and exposed nature of the system components. The system is set up over 10 days and dismantled in just one. During the event, thousands of spectators troop over some five miles of cable, while blithely knocking against phone conduits and other network equipment.

"So we use the network in place as little as possible, using it primarily to move scoring changes to the hundreds of terminals we feed," observes Jeff Schroeder, Unisys technical manager. "Applications are on the PCs themselves, which continue to function even if the flow of scoring updates is disrupted temporarily. So even if the network is down, you don't present a blank screen and look like you are down."

This guaranteed uptime of the



Laying the cables which carry data to and from the Media Center

The Open are not golfers.

"That means our broadcasts have an education and explanation role to fill," says BBC's Slater. "We want to increase their enjoyment, and we work with Unisys on ways to do just that." One such innovation is tracking data on the precise distance a golfer's ball is from the hole on any given stroke—data that can be presented to viewers graphically in a number of ways.

FROM PUTTS TO DATA

Just how do these and other data get from the course to the myriad applications the media use to create entertaining coverage? And what are some of the most common applications Unisys has developed to process and interpret the scoring information its

Shoulders Of Giants

Mission-critical information systems must carry on their vital work no matter what the environmental obstacles. The British Open has provided its own set of unique, if not amusing, challenges to keeping the Unisys scoring information system up and running.

Take, for example, the time a beer truck pulled up for a delivery not far from the Media Center. The driver lowered the lorry's lift gate directly across several cables, severing them completely. Fortunately, the fully-distributed nature of the Unisys architecture allowed the workstations to continue processing the most current scoring information available until the lines could be reconnected.

Then there was the time some journalists in the Media Center noticed intermittent, rhythmic disruptions on their screens.

Troubleshooters soon located the problem source: a nervous golfer waiting his turn to play. It seems he was tapping his spiked shoe against a cable underfoot.

With 20 years of Open experience under its belt and 15 engineers, software experts and other staff on site, Unisys manages to keep the scoring system up and running through every common and quirky obstacle, notes Jeff Schroeder, technical manager of sports marketing at Unisys.

"Knowing all that can go wrong when so much of the system is put up only temporarily, we make sure we have strong performance-monitoring systems in place," Schroeder says. "Quite often we are able to detect and fix a problem before anybody is aware anything is wrong in the first place."

nodes on the network, regardless of what happens to the network itself, is owed to a proprietary and highly resilient network protocol Unisys built for its scoring system. Each of the terminals and servers in the data center forms one piece of a truly distributed system running a custom-built database. This way, the sometimes-finicky network is hidden from the performance picture.

In addition, the Unisys team shuns ultra-modern network connections such as fiber optics. The reason? "We can get any phone person in the

country to fix a standard wire line, but that just isn't the case with a piece of optical cable," Schroeder says. "In this way, we keep our network connections running over what, in this case, is the simplest and most robust technology available."

FROM DATA TO ENTERTAINMENT

With current scoring information safely delivered to hundreds of terminals and workstations on site, the Unisys-engineered applications kick in. Whether it is a television station in Stockholm that wants a scoring and

position update of key Swedish players, or a producer at ESPN looking for scoring data on the toughest holes, the information is readily available from the menu-driven system.

"It's amazing how easy they've made it to get so much information presented so many different ways," says McDougall. "The system makes the media so much better at doing its job."

Included among the many ways Unisys applications present raw scoring data are:

■ A detailed leader board showing

Fast Facts:

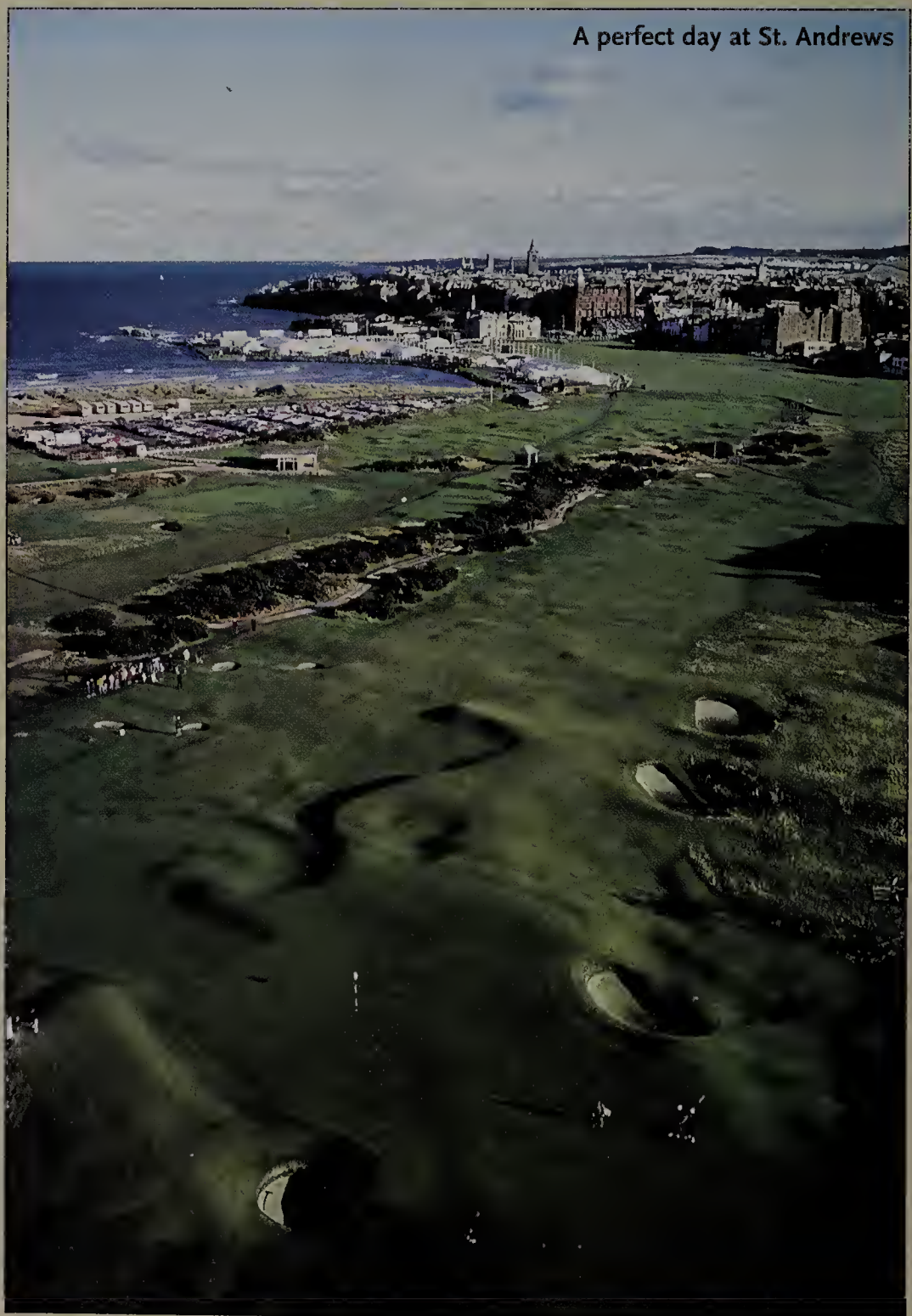
■ From simple beginnings in the early 1400s, golf became so popular at St. Andrews that King James II banned the game in 1457, feeling it distracted young men from archery practice. The ban was repealed in 1502 by James IV, himself an avid golfer.

■ The first Open Championship was played on the Old Course in 1873. In this first year of the New Millennium, The Open will be played for the 26th time at St. Andrews.

■ The Old Course features a daunting 112 sand traps. The faces of the two most treacherous traps were built using railroad sleeper cars sunk into a concrete base beneath the wall of the actual playing turf, which is 10 feet above where a golfer must try to blast his ball.

■ The largest green measures more than 1.5 acres.

■ There are six golf courses comprising the St. Andrews Links. All of them, including the famed Old Course, are open to the public, reflecting the intentions of King David, who gave the links land as common land for townspeople in 1123.



A perfect day at St. Andrews

UNISYS Benson & Hedges International Open 6:04											
Course Scoring Summary - All Rounds											
HOLE	YARDS	PAR	AVERAGE	RANK*	EAGLES	BIRDIES	PARS	BOGEYS	DOUBLE BOGEYS	OTHER	
1	411	4	4.284	8	0	38	274	129	12	4	
2	379	4	4.171	10	0	82	283	110	10	0	
3	538	5	4.775	17	0	188	228	88	7	1	
4	442	4	4.354	2	0	37	248	149	23	1	
5	408	4	4.104	14	0	81	293	92	8	0	
6	398	4	4.291	5	0	48	284	128	20	4	
7	177	3	3.128	12	0	80	311	82	8	3	
8	426	4	4.238	7	1	88	284	107	21	8	
9	433	4	4.328	4	0	47	248	127	33	1	
Out	3611	38	37.872		9	645	2395	979	142	19	
10	311	4	3.919	16	8	117	288	42	21	2	
11	418	4	4.200	9	0	47	288	108	12	2	
12	208	3	3.343	3	0	40	273	100	34	8	
13	384	4	4.162	11	0	81	293	79	18	7	
14	190	3	3.127	13	0	82	288	88	8	0	
15	848	5	4.873	18	11	183	210	48	1	2	
16	413	4	4.229	8	1	41	288	108	18	3	
17	884	5	4.993	15	3	100	288	82	9	1	
18	473	4	4.734	1	0	21	182	183	78	13	
In	3507	35	37.370		20	682	2357	818	192	38	
Total	7118	72	75.042		29	1208	4752	1796	334	67	
* Ranked from 1 (Most Difficult) to 18 (Least Difficult)											
Round One	Round Two	Round Three	Round Four	All Rounds	Course Stats	Course Map	Hole Info	Course & Hole Info	Print Report	Main Menu	
F1	F2	F3	F4	F5	F6	F7	F8	F9	F10	F11	F12

The Unisys course summary

scores on individual holes for the 150+ golfers in the tournament;

- Statistical leader boards detailing data such as the number of fairways golfers hit off the tee, the average or maximum drive lengths on specified holes, greens reached in regulation (by the second shot on a par 4, the third on a par 5), total putts taken by individuals, or the average putts of entire groups of golfers;

- A group-locator allowing the media to track the status of specific pairs of golfers on the course;

- Scoring distribution graphs showing the numbers and identities of golfers playing at par or at any number of strokes above or below par;

- Golfer pairings by tee time, alphabetically, or by nationality;

- A "cut projection" tote that provides highly accurate forecasts of which players on the course are likely to score well enough to continue playing on the last two days of the tournament, and which are destined for an early shower.

"It's usually a matter of one click and, just like that, we've got the information we want," observes Slater. "The screens are clean and easy to read. Their pages are TV-friendly. It's

just great stuff." Working with the media clients and the Royal and Ancient Golf Club, Unisys continues to evolve the scoring system with an eye toward incorporating leading-edge technologies. Slater notes that the BBC is mulling the use of virtual reality technology that will visually place TV



The British Open staff update a leader board as the crowds watch on.

viewers in an animated, real-time setting faced by a particular golfer in a specific situation on the course. The handheld greenside terminals are destined to be replaced by intelligent palm-top devices that will leverage that intelligence, as well as cellular connectivity, to speed match

updates to the media and to the world's viewers. "While respecting our traditions, Unisys has done so much to pioneer the speedy delivery of Open information throughout the world," says Duncan Weir, golf development secretary at the Royal and Ancient. "We certainly plan to continue our long relationship with them."

CIO

Custom Publishing

Old & New

Ask any golfer worth his weight in bunker sand why golf courses have 18 holes. He'll tell you it's because that's how many holes there are at the Old Course at St. Andrews in Scotland. Actually, there were 22 holes originally. In 1764, when golf at the course entered its 350th year, these were reduced to 18 holes.

Unlike any other championship course in the world, the Old Course, with its undulating fairways, hellacious sand traps, and double (two-holed) greens yielding putts as long as 100 yards, was not designed by an architect. Rather, it evolved with tradition and time over six centuries of play.

"We deeply respect tradition here at St. Andrews and certainly at The Open, which is the oldest major golf championship and the only one played outside the U.S.," notes Duncan Weir, golf development secretary at the Royal and Ancient Golf Club of St. Andrews. "But at the same time, we've had to be at the forefront of technological advancement over the years. At the base of that has been our relationship with Unisys. Unisys is among a very small number of companies we call official suppliers—our most trusted companies with whom we've had long-term relationships and who provide an essential service."

The relationship has flourished since the earliest days when Unisys developed the first computerized scoring system 20 years ago. "Unisys' quality and delivery of service is first-class, no doubt about that," Weir concludes. "They are constantly working with us to try to improve that service."

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Compact. Industrial designers have incorporated those characteristics into the sleek styling of wireless devices. In the process, they've transformed personal digital assistants (PDAs) from utilitarian tools to chic accessories that make a statement about the personalities of their owners.

Just flip through the pages of *Vogue* and *GQ* and you'll find models now completing their designer ensembles with Palm Vs and Nokia cell phones. Indeed, these devices have as much presence in fashion magazines as Hermès scarves and Rolex watches.

It's not just the beautiful people who carry these accoutrements close to their hearts. Visit any airport and you'll find professionals with pagers, PDAs and cell phones peeking out of pockets. "Because you carry them around all the time, these devices become very personal," says

John Cook, senior director of product marketing, consumer products group, for Santa Clara, Calif.-based Palm Inc. "They say something about you. When you flip the antenna [of the Palm VII], you're sending the signal, 'I'm connected.'"

Nonetheless, according to Marie Essex, chair of the fashion design department at New York City's Parsons School of Design, wireless accessories are not necessarily driving fashion designers' thinking. Although designers use these tools themselves, they aren't designing for or around them. Yet, she says, "several years ago, licensing really took off, with designers' names going on everything from braces to coffins, and technology won't be any different. No doubt you'll soon be able to get the Donna Karan PDA. Or you'll buy a Gucci bag that will come complete with a matching phone."

—Meridith Levinson



Maynard

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The Power to Know™



Washington Watch

By Elana Varon

Antitrust Fever

THINK THE government has shot its bolt on the Microsoft antitrust case? Think the trust busters will be satisfied with Bill Gates' scalp? Think again. The feds are now cocking their collective eyebrows at online exchanges. So if you're thinking about joining one (and who isn't?), this might be a good time to call your lawyers.

A couple of online collaborations have already drawn the attention of government lawyers and Congress, both of which are asking whether competition will be quashed by the B2B exchange planned by the Big Three U.S. automakers or by a proposed consumer travel website, Orbitz, supported by 30 airlines. (Travel agents are understandably concerned about the latter.) In April, the FTC and the Justice Department jointly

described their parameters for determining the illegality of such newfangled collaborations. But Hillard Sterling, an antitrust lawyer with Gordon & Glickson in Chicago, says it's anybody's guess what constitutes unlawful collusion online. "This really is the new frontier of antitrust law," he says.

If that has you reaching for the Maalox, Sterling says relax. If your B2B or B2C exchange seems aboveboard—that is, you're not excluding your competition or fixing prices—then the government is less likely to come calling. Nevertheless, Sterling advises, it's a good idea to factor in the risk of an antitrust suit when you're developing your deals.

Still nervous? Stephen Margolis, an economics professor at North Carolina State University, says regulators may give electronic marketplaces a pass until they mature. "There's almost an [unofficial] infant-industries waiver," he says, because

the government doesn't usually go after startups. Trouble comes when a venture grows. Large, mature companies have legal departments attuned to antitrust issues. Margolis says Microsoft's problems began when it grew faster than its awareness of its legal exposure.

For now, regulators are using "pre-e" standards to assess whether online exchanges are

anticompetitive. But Margolis suggests that one significant test—how much market share a venture controls—might not apply online. A successful electronic exchange is supposed to cover an entire market, he says, but that doesn't necessarily mean participants are trying to limit customer choices.

If regulators go after exchanges just because they dominate a market, "everyone will find themselves in litigation all the time," he says. But the evolution of e-commerce won't wait while these philosophical questions are hashed out.

Be a Squeaky Wheel

NOT SURPRISINGLY, in the e-commerce race, most federal agencies are stuck in the starting blocks. Although the 1998 Government Paperwork Elimination Act mandates that the government be doing business online by 2003, one federal e-commerce expert says agencies may need a push to take that charge seriously.

"If companies want government agencies to do business with them online, they should start citing the law," advises Tony Trenkle, coordinator of online services for the Social Security Administration. Social Security has already tested new systems for collecting W-2 forms online from 101 employers, and the system has the potential to collect them from 6.5 million.

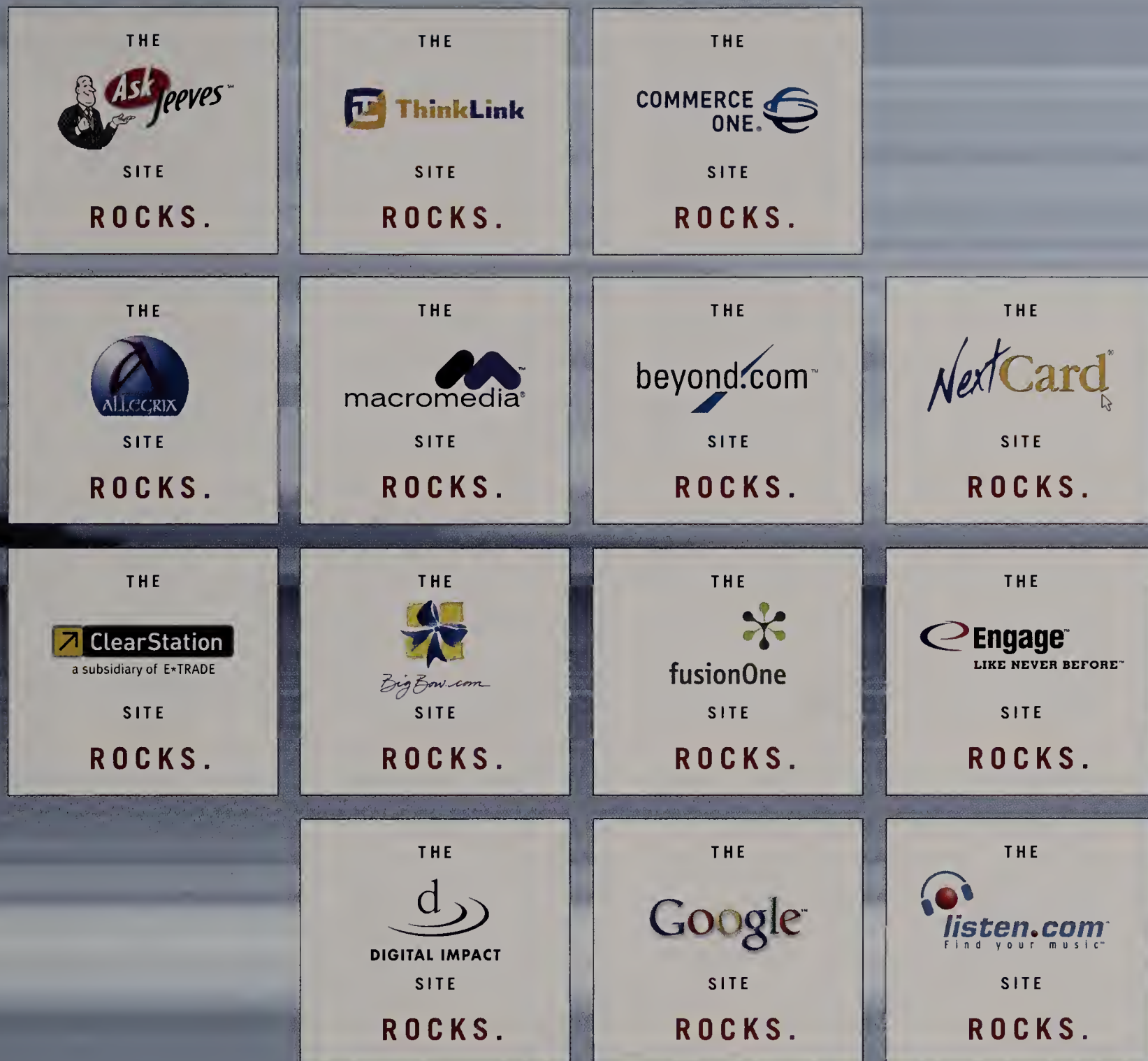
Chuck Liptz, who's in charge of the Social Security project, says that agency officials surveyed businesses to get ideas on the technologies and security safeguards they wanted. But it's not clear whether other agencies will ask the same kinds of questions—mostly because they don't have to. The White House Office of Management and Budget, which has to approve agencies' online plans, hasn't decided whether those plans should be made public.

Got news or views about what's happening in Washington? Send e-mail to washington@cio.com.



"That kind of notice doesn't do consumers much good."

—Federal Trade Commission Chairman Robert Pitofsky on websites that bury their privacy policies.



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LEADERSHIP

The IT World Is Not Enough

By Elizabeth Heichler

Fast, Hyped and in the Red

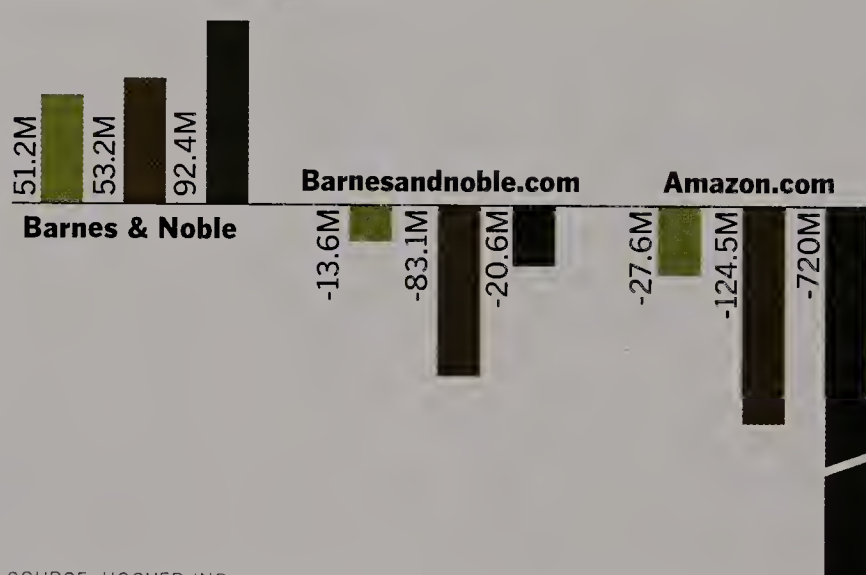
SALES AT BIG DOTCOMS like Amazon are finally taking off, but the losses are proportional to the gains. Can rapid growth help the dotcoms turn the corner on profitability? Not this year. (For more on e-business strategies, turn to Page 88.)

Barnes & Noble	Barnesandnoble.com	Amazon.com
Year established		
1873	1997	1995
Market value as of June 7, 2000		
1.3B	1.2B	18.2M
1999 Sales Growth		
19.8%	227.8%	168.8%

GROSS SALES (dollars) 1997, 1998, 1999



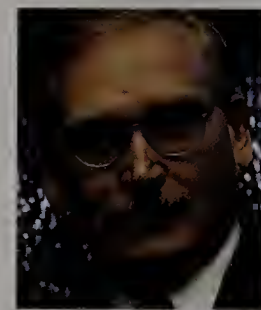
NET INCOME OR LOSS (dollars) 1997, 1998, 1999



SOURCE: HOOVER INC.

KEN MICHAELCHUCK, CIO of Philip Morris Cos., was happy to land a divisional CIO who had not previously worked in IT. He came from operations—like Michaelchuck himself. And that's not as odd as it sounds.

"There's a lot of demand [from CIOs who hire IT leaders] for getting outside the technical point of view," says Norman McEachron, vice president of Stamford, Conn.-based Gartner Consulting in the San Jose, Calif., office, who has conducted extensive surveys on the roles and relationships of CTOs and CIOs. The kinds of people who make good leaders in today's global economy may be different from those who used to succeed in IT. These days, "people who focus on internal things might not have the necessary understanding of stakeholders' customers," McEachron adds. "We've got a whole generation of people used to administration and systems upkeep and acquisition of infrastructure. Now we have to look at IT as deployment of competitive tools."



Ken Michaelchuck

To round out individuals whose technology skills outweigh their business acumen, Anthony Foster, CIO of Imperial Chemical Industries in London, advocates giving them work experience throughout the business. "Either expose them to business issues or put them at the table where business is being discussed," he advises. Early in his own career, he worked as an operations line manager for a large energy multinational in Canada, which he says was a tremendous learning opportunity that gave him credibility among his business associates. "In a later assignment," Foster adds, "I was human resources manager for a division in that same multinational. This allowed me to work very closely with the division president and actively participate as a member of his executive committee. These early career experiences have been critical to my development."

For more on global leadership, see "A Head for the Business," *CIO*, June 15, 2000.

**"Web portals are like SELF-HELP BOOKS—
if they WORKED, you'd need only ONE."**

Joshua Walker, analyst, Forrester Research



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SOFTWARE DEVELOPMENT

Square Dance

By Karen Witham Lynch

HARVI SACHAR'S background in IT management has given him firsthand experience with the frustrating and time-consuming process of finding qualified software development talent. So in July 1999 he launched ITsquare.com, in San Jose, Calif., with the goal of facilitating working relationships worldwide between small and midsize software development firms and companies seeking their expertise. In addition, Sachar hoped to give those developers exposure to new

markets and opportunities. He wanted it to be, as the name suggests, a virtual "town square" where

companies could conduct their software services business.

ITSquare's online database currently includes more than 2,000

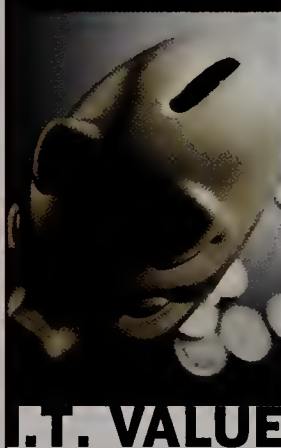
companies, which comprise more than 80,000 individual developers. About 75 percent of those companies are U.S. firms; the rest are headquartered overseas. ITsquare's goal in the near future is to have its database split more evenly between U.S. and foreign vendors. The service is free to clients. Vendors pay ITsquare a transaction fee that's 5 percent to 15 percent of a project's cost, once they receive payment from the client.

"We help manage the process of software development and collaboration," says Sachar. "Then we provide a secure work area where all transactions are tracked and documented. In fact, one of the biggest values we bring to the table is workflow process automation."

This automation can cut by half the time it takes to reach and sign a contract agreement. According to Sachar, that process, including finding qualified vendors, reviewing their backgrounds and wading through their bids, traditionally takes around six weeks. Now all of that can be completed in one to three weeks.



HOT TOPIC



IT VALUE

Can't Measure Heat with a Ruler

By Katherine Noyes

You may think your IT group is delivering significant value to your company's bottom line, but do higher-ups agree? Possibly not: In the wake of costly Y2K, ERP and e-commerce initiatives, there's been a widening gap within many organizations between the IT group's opinion of its value and top management's perception of that value.

ment's perception of that value.

What's a CIO to do? A recent report by Meta Group (www.metagroup.com), of Stamford, Conn., offers some suggestions. First, figure out how the IT organization is currently expected to add value to the business. According to Meta, most companies envision one of three roles:

- 1) IT supports the business primarily by providing tactical support for current business processes.
- 2) IT operates like a business within a business, using its products and services to provide business solutions.
- 3) IT becomes the business by fusing operations and eliminating major differences between the business and IT planning, performance measurement and the like.

Once you've figured out which one best matches your company's current expectations for IT, make sure you're measuring the value of IT appropriately—using the wrong metrics can hurt IT's credibility, Meta asserts. If your group is expected to fall within the first expectation, for example, value should be measured in terms of cost and efficiencies. For the second, the focus should be on effective resource investment. And for the third, according to Meta, what's most important is real value delivered to markets, such as IT's contribution to market penetration.

Finally, think about how you'd like the company to perceive your IT group. Meta recommends creating a "value agenda" that defines and addresses the gap between current and desired value positions. That agenda should include strategies for bridging that gap: techniques for aligning value expectations, identifying value opportunities and creating a value "playbook," or action plan.

Not surprisingly, Meta recommends using its Value Assurance Program to get your organization headed in the right direction. But whatever route you take, the end result—better alignment with the business—should be well worth the trip.



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THE WEB

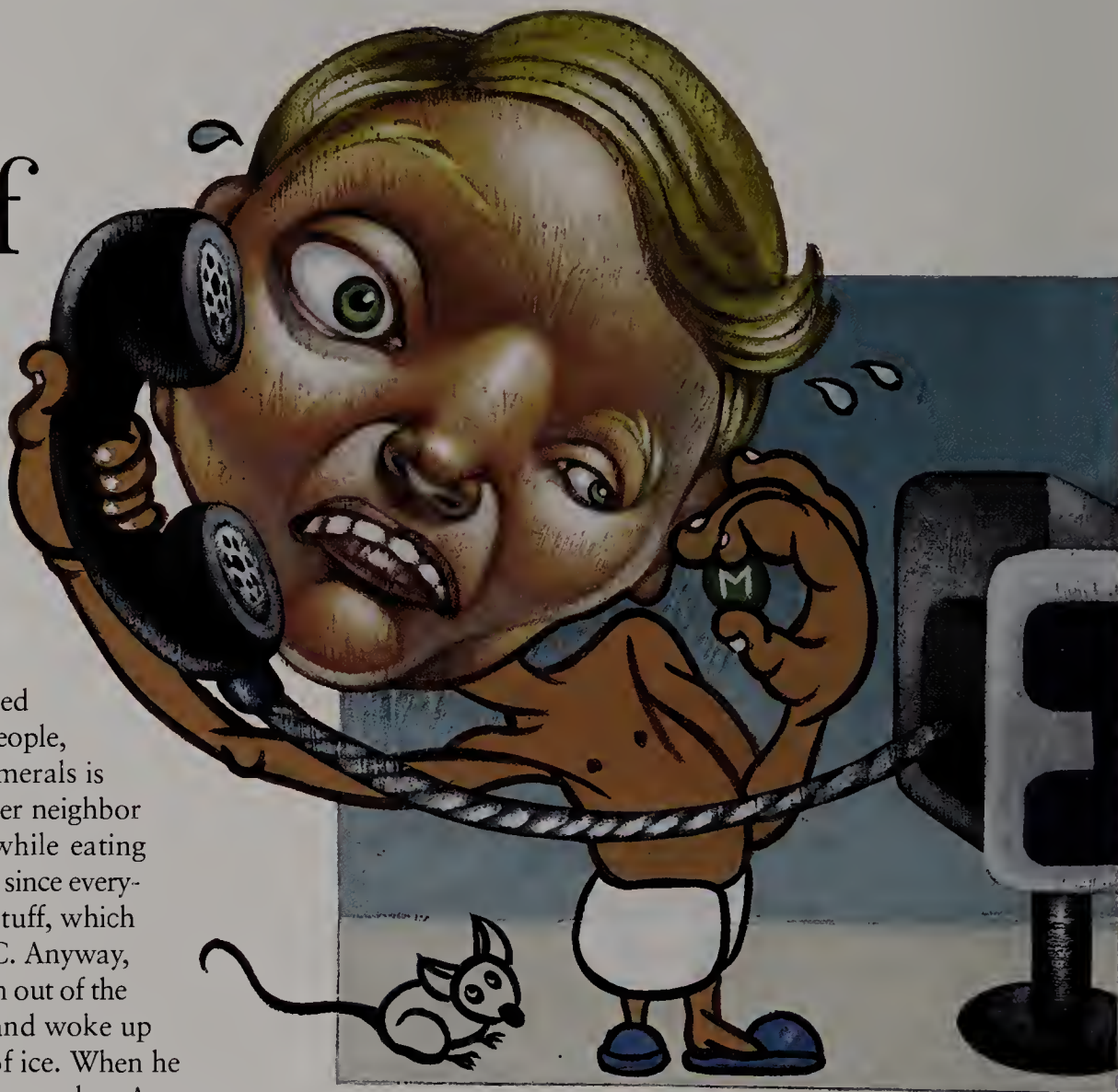
Legends of the Folly

YOU KNOW THAT a lot of your organization's bandwidth is eaten up by a constant stream of messages like the one below. What can you do but laugh? (See "Rumor Killer" below.)

"On my way to the post office to see whether my free case of M&M's had arrived (after all, I had forwarded an e-mail to five people, celebrating the fact that 2000 in Roman numerals is MM), I ran into a friend doing errands for her neighbor who was sick from having ingested a rat while eating Kentucky Fried Chicken—unsurprising, really, since everyone knows there's no actual chicken in that stuff, which is why the company changed its name to KFC. Anyway, bad luck for that guy because he had just gotten out of the hospital. Seems he went to a bar one night and woke up the next day sore all over, in a bathtub full of ice. When he stood up, he realized that his kidneys had been stolen. A note on his mirror read, "Call 911!" He tried, but a voice on the line asked him first to press #90, which he did, unwittingly giving the bandit full access to his phone line at his own expense, and he couldn't get through. He would have e-mailed for help but was afraid to use his computer because it contained a hard-drive-destroying virus in an e-mail entitled "Good Times." He knew it was real because he himself was working on software to prevent global disaster when all the computers get together and distribute the \$250 Neiman Marcus cookie recipe.

He then went to a pay phone. But when he reached into the coin-return slot, he got jabbed with an HIV-infected needle around which was wrapped a note that read, "Welcome to the world of AIDS." Despite his condition, he tried to drive himself to the hospital. On the way, he noticed another car driving without its headlights on. To be helpful, he flashed his own lights and was promptly shot by people in the other car as part of their gang initiation rites.

Let that be a lesson to you, and send *this* story to everyone who sends you junk mail. If you don't,



you'll get a flesh-eating disease from Caribbean bananas, you'll be scooped out of the ocean while scuba diving and dumped in the middle of a forest fire, and the government will tax all your e-mails forever. That must be true—I read it on the Internet."

—Adapted from the Web.

Rumor Killer

IF YOU DOUBT some of the things you read on the Net, despite their fervent claims of verity, bookmark one of the following sites. They track the origins and strange lives of Internet hoaxes, rumors and junk mail, and even find a legitimate item or two out there. When you get that next heartrending plea for electronic signatures, go to your urban legend debunking site and, finding that particular message listed, rest assured that you are not being apathetic, just smart.

■ **Urban Legends and Folklore** (urbanlegends.about.com/culture) is the easiest to navigate and most joyously sarcastic of the bunch.

■ **Urban Legends Research Centre** (www.ulrc.com.au) lets you submit a research request.

■ **Urban Legends Reference Pages** (www.snopes.com) sorts items by category (animals, Coke, sex...) and offers a good list of books and other sources of information on urban legends.

—Sandy Kendall

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Off the Shelf

Edited by Carol Zarrow

The Leader Who Came in from the Cold

Leading at the Edge: Leadership Lessons from the Extraordinary Saga of Shackleton's Antarctic Expedition
By Dennis N.T. Perkins
Amacom, 2000, \$24.95

I was in my early 20s when I first read *Endurance: Shackleton's Incredible Voyage*, Alfred Lansing's fine account of Ernest Shackleton's 1914 Imperial Trans-Antarctic Expedition, and it remains my favorite leadership book. So when I heard about *Leading at the Edge*, I was interested but skeptical. I was prepared to advise readers to read instead Lansing's book or the more recent *The Endurance: Shackleton's Legendary Antarctic Expedition*, by Caroline Alexander.

I was pleasantly surprised. Perkins' book is sort of a leadership study guide, using incidents from Shackleton's expedition. For example, the chapter on mastering conflict discusses the importance of engaging dissidents and points to expedi-

tion photographer Frank

Hurley, who was something of a troublemaker when not included in decisions. So Shackleton made Hurley a member of his inner circle—even though he didn't value Hurley's advice as much as that of some of the others.

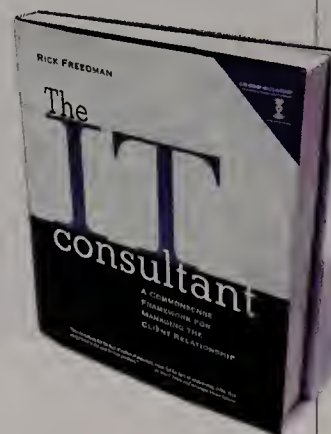
If applying a polar expedition to your own

situation seems too much of a stretch, the book also includes four case studies of companies that have dealt with their own "edge" situations.

—Abbie Lundberg

And...

The IT Consultant: A Commonsense Framework for Managing the Client Relationship
By Rick Freedman
Jossey-Bass/Pfeiffer, 2000, \$39.95



Does an IT executive's technical competency guarantee that he or she can successfully deliver strategic IT services? No, argues Rick Freedman, IT trainer and consultant. The real make-or-break IT management skills, he says, are those related to human communication and interaction. This comprehensive and well-written text is for anyone who would like to acquire or brush up on IT management skills.

—Carol Zarrow

CIO Best-Seller List

5.

Digital Capital: Harnessing the Power of Business Webs
by Don Tapscott, David Ticoll and Alex Lowy
Harvard Business School Press

4.

Who Moved My Cheese?: An Amazing Way to Deal with Change in Your Work and in Your Life
by Spencer Johnson
The Putnam Publishing Group, 1998

3.

Irrational Exuberance
by Robert J. Shiller
Princeton University Press, 2000

2.

The Tipping Point: How Little Things Can Make a Big Difference
by Malcolm Gladwell
Little, Brown and Co., 2000

1.

The Leap: A Memoir of Love and Madness in the Internet Gold Rush
by Tom Ashbrook
Houghton Mifflin Co., 2000

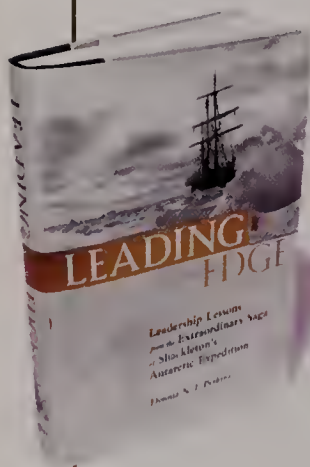
SOURCE: May 2000 data, compiled by Words Worth Books, Cambridge, Mass.

TELL US what you're reading and why at books@cio.com. Visit the Reading Room at www.cio.com/books.

What They're Reading

Paul Rials, CIO, Dentsply International, York, Pa. *Net Future: The 7 Cyber Trends That Will Drive Your Business, Create New Wealth and Define Your Future*, by Chuck Martin (McGraw-Hill, 1998) "Its strength is its ability to look at current trends and extrapolate their impact on the future."

Brian Light, CIO, Staples, Framingham, Mass. *The Innovator's Dilemma: When New Technologies Cause Great Firms to Fail*, by Clayton M. Christensen (Harvard Business School Press, 1997) "It makes management aware that asking customers what they want is not enough. I liked it so much I gave a copy to Staples' CEO to read."



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THIS IS NO TIME FOR CONVENTIONAL THINKINGSM

RESEARCH

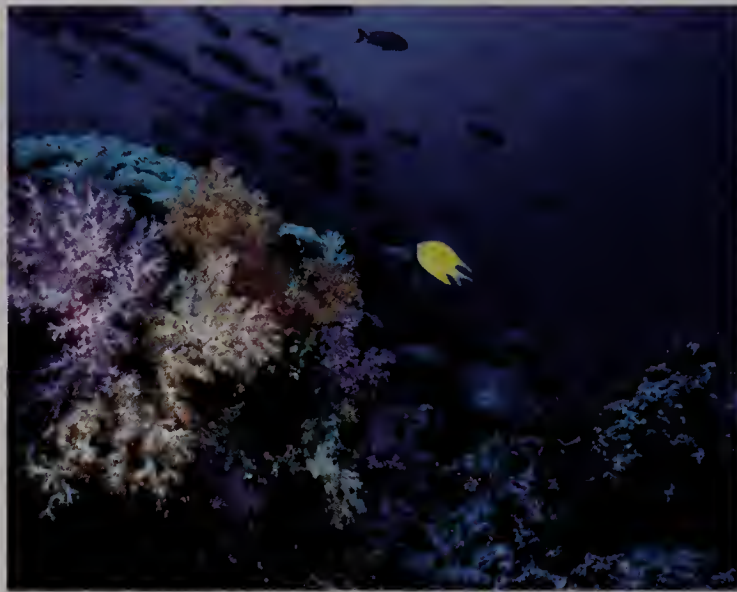
That's Really Deep

By Karen Witham Lynch

SCIENCE APPLICATIONS

International Corp. (SAIC), a research and engineering company headquartered in San Diego, recently donated information technology and engineering equipment worth \$1.67 million to the Woods Hole Oceanographic Institution (WHOI), in Woods Hole, Mass., a private, nonprofit corporation dedicated to ocean science research and education.

A third-party assessor determined that impressive dollar value, but the real value to Woods Hole researchers is that the donated shipboard technology permits onsite analysis of seafloor sediment to detect chemical contamination. Researchers can send the equipment, attached to a 20,000-foot cable, down to the ocean floor, where it grabs a scoopful

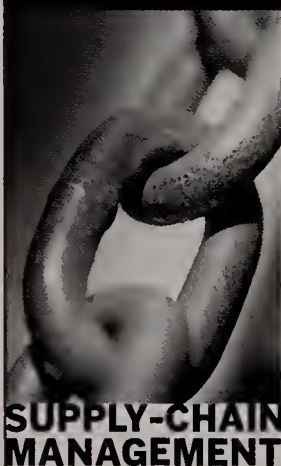


of sediment, instantly analyzes its chemical composition and then moves on, ready to process another section. Since analysis takes place on site, fewer sediment samples have to be analyzed in shore-based laboratories,

resulting in savings of time and money to marine monitoring programs.

The technology was developed primarily at SAIC's Newport, R.I., location, whose proximity to Woods Hole has led to a relationship between the two organizations' scientists. "We have a long-standing research relationship with Woods Hole," says Joe Daniele, senior vice president of intellectual property and technology commercialization at SAIC. "Due to changing market conditions, this technology no longer fits our business plans; but rather than just put it aside, we asked ourselves, 'Why not donate it to someone who could further develop it?' "And the deal has created satisfaction all around: WHOI has newly acquired technology, and SAIC has a recently realized tax break.

HOT TOPIC



SUPPLY-CHAIN MANAGEMENT

Let's Get...Vertical?

By Derek Slater

Business-to-business exchanges have the potential to slash costs out of the supply chain and nobody is more excited about that than venture capitalists. In fact, Boston-based AMR Research estimates that 600 such exchanges have sprouted up within just a year and a half as VCs look to cash in on the trend.

As in any overpopulated space, only the strong will survive, while the weak will eventually be either trampled or eaten. And one of the deciding factors in separating the fit from the faint will be whether buyers, who are supposed to use these exchanges to source new and inexpensive suppliers, decide to go vertical or horizontal. Vertical exchanges, such as CheMatch.com and Commerx's PlasticsNet, operate in a single industry, whereas horizontal exchanges like SupplierMarket.com try to attract a broader spectrum of participants across multiple industries. In SupplierMarket.com's case, the business is simply "parts," whether those parts are of plastic, metal, wood, plaster or some other material.

Vertical markets—or at least the good ones—offer industry expertise as their key selling point. They can build their trading infrastructures and services on the idiosyncratic needs of whichever industry they serve. Horizontal exchanges are unlikely to provide the same depth of expertise, since they handle multiple kinds of materials. That breadth may, however, provide buyers with a countervailing advantage. "What [buyers] are really trying to do is get efficiency from the exchange and reduce cycle times," says Murali Menon, vice president of engineering for SupplierMarket.com, in Burlington, Mass. "We're capturing a larger percentage of [what we need on] a typical project," he says of his company's horizontal approach. In other words, not only does a buyer that's building office parks or battleships need steel, but it also needs plastic, glass and other materials, and sourcing all those different products through a horizontal exchange can simplify its purchasing activities.

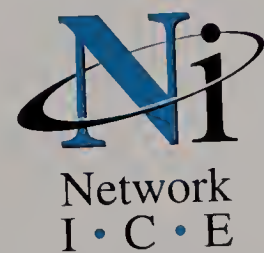
Some exchanges within each model will likely survive. However, it's worth noting that among AMR Research's list of the 40 strongest exchanges, the vast majority are at least beginning life as verticals.

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Stop Hackers Cold



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New Economy

Opportunities and Risk in a Changing World

The Rising Cost of Waiting

The Internet makes globalization easier, cheaper and faster. But you'd better act before your local competitors around the world do, or your costs will explode.

BY ANIL K. GUPTA AND VIJAY GOVINDARAJAN

IF YOUR COMPANY is doing business on the Internet, the pressures to globalize at Internet speed are—or soon will be—enormous.

After all, the Internet is our first real global medium—the business models that are developing on the Web tend to be globally applicable. People in Korea, for example, don't buy books or music or industrial parts much differently than people in Brazil, Germany or the United States. Once a company has created a new Internet business model for one market, it has essentially created one for the entire world. Furthermore, Internet business models thrive on increased scale—popularly known as “Metcalfe's Law”—whereby, the value of the network rises exponentially with the number of people connected to it. This effect is particularly evident in the rise of information portals like Yahoo and for sales intermediary portals like eBay.

Given all the other issues that companies have to worry about—serving and building their home markets, for example—globalization can easily become an option rather than an imperative, but there is a price to be paid for waiting. Delayed globalization implies high opportunity costs in the sense that it gives local competitors around the world a chance to develop



their own versions of eBay or Yahoo before those companies arrive on the scene. With established local players already in place, it will be much tougher for global companies to grab share in local markets, even with the advantages offered by the Internet.

However, our research suggests that companies should carefully consider the “cross-border scalability” of their business models before trying to go global. By this we mean the degree of additional financial and managerial resources needed to enter a new market abroad.

Companies selling pure information goods (whose products can be delivered online) generally have much less need for local infrastructure as compared with those selling physical goods (which must also establish a supply chain infrastructure that can reach customers in foreign markets). On the other hand, the greater the need for local adaptation of the com-

ILLUSTRATION BY EDWINA WHITE

Why can't e-commerce simply be commerce?

Why can't my brand still be my brand? Why can't it all work

together? It can.

B-unified."



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pany's products, services and other elements of the marketing mix, the less scalable the model becomes in managerial and organizational terms. Certain products or services (such as telephone wireless service, for example), require very little adaptation across borders. Others (such as Amazon.com's portfolio of books targeted to its German versus British customers) require considerable adaptation to the unique needs of the various markets.

As a portal providing Internet navigation services to its users, Yahoo's product was pure information. Thus, Yahoo did not need any warehousing or other logistics infrastructure in any

ufacturer. Lee Hung Fat has established production facilities also in mainland China and Bangladesh. A network of cameras on factory floors, all connected through the Internet, allows the company's operations director to transmit scanned pictures of samples or even parts of samples to his customers abroad, to track the operations at each of his factories and to hold videoconferences with his dispersed managers.

An important byproduct of dramatic improvement in ability to coordinate geographically dispersed operations will be that physical colocation of complementary activities will become less critical. As coordination across locations becomes

better and cheaper, companies will face increasingly greater pressure to tap into the comparative advantage of different locations for every subactivity (whether internally performed or outsourced) in the value chain. For the same reasons, companies will also have much greater access to a wider base of resources and

Larry Carter, Cisco's chief financial officer, estimates that by running the company on the Web, Cisco is saving about \$500 million per year.

market. Of course, Yahoo believed in offering localized content in local languages. Thus, before Yahoo's business model could be replicated in a new market, it required development of local content (in other words, search and classification of information about local websites) and localization of language. Given Yahoo's strategy of being a pure navigator that helps customers access content developed by third parties other than itself, these were relatively straightforward, risk-free tasks. Thus, Yahoo's choice to move aggressively in foreign markets—before local imitators had a chance to spring up—was consistent with the very high scalability of its business model.

PSINet in Ashburn, Va., which began as an Internet service provider (ISP), had a more daunting challenge in going global. For even though its business model was essentially applicable anywhere (Internet access and hosting work the same way around the world), it needed expensive local infrastructure—namely high-capacity fiber-optic networks—to carry data in and out of foreign markets. So PSINet pursued a voraciously acquisitive globalization strategy, buying up local ISPs around the world. After acquisition, the acquired customer base of the local ISPs could be easily plugged into PSINet's own lower-cost infrastructure backbone. PSINet could also use this backbone to bring global value-added services to the local market.

The good news for companies taking the globalization plunge is that once they are established around the world, the Internet will bring dramatic improvements to their ability to coordinate geographically dispersed operations. This will be increasingly true not just for large corporations with huge investments in information technology but also for small firms with relatively simple devices. Consider, for example, the Lee Hung Fat Garment Factory, a Hong-Kong based clothing man-

ufacturers worldwide.

These global Internet companies are not just science fiction, however. They already exist. Cisco Systems in San Jose, Calif., the networking equipment and services company, received 40 percent of its FY 1999 revenue of \$12.2 billion from outside the United States, with 80 percent of its orders coming over the Web self-configured by the customer.

Larry Carter, Cisco's chief financial officer, estimates that by running the company on the Web, Cisco is saving about \$500 million per year (equal to one-sixth of its FY 1999 operating income of \$3 billion). He added that given the scarcity of technically trained manpower and the complexity of the company's operations, Cisco simply could not have grown at a nearly 50 percent annual rate without living on the browser.

Cisco is a leading example of a "netcentric" global company that is not only finding ways to spread its business model around the world but is also providing a role model for how the global corporation of tomorrow might be organized and managed. We are inclined to agree with John Chambers, Cisco's president and CEO, when he proposes that, in the Internet Age, the race will be won not by those who are big but by those who are fast. Of course, the interesting question then becomes: What happens when everybody is trying to be both big and fast? Over the coming decade, it should be a fun race to watch. **CIO**

Do you think you need to go global now, or can you afford to wait? Let us know at neconomy@cio.com. Vijay Govindarajan is a professor and faculty director for the Global Leadership 2020 program at Dartmouth College's Amos Tuck School. Anil K. Gupta is professor of Strategy and International Business at the Robert H. Smith School of Business at the University of Maryland at College Park.

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Ask the Expert

We're Not Experts on This, but We Know Someone Who Is

Knowledge Pool

Wendi Bukowitz and **Ruth Williams**, authors of *The Knowledge Management Fieldbook* (Financial Times, 1999), answered readers' questions on CIO.com about their area of expertise—knowledge management—and offered tips on implementing KM within geographically dispersed organizations. Here's what they had to say.

Q: I'm just getting started on a KM project at my company. What questions should we ask management in order to determine their KM needs?

A: First of all, we see a bit of a red flag when you talk about determining management's KM needs. A KM system designed around management may not be helpful to those who really need to gather information. In fact, management often fails to see a KM need, because when they need information they generally just ask a subordinate, and it miraculously appears. A KM system should meet the needs of the people, not simply the needs of an elite group. The first question you need to ask those who are expected to use and contribute to a KM system or process is, "What mission-critical information do you need to do your job?" Is it previously completed project deliverables? Is it process methodologies? Is it customer information? The answers should serve as the cornerstone of your KM initiative. Furthermore, you will want to look at how your organization conducts KM now (every organization practices some form of KM, even if they don't call it that). What is your com-



pany good at? What needs work? You can then prioritize where you ought to focus your efforts.

Q: Why is KM different from information management?

A: One persistent myth about the difference between knowledge management and information management is that knowledge management is about managing knowledge, while information management is about managing information. While knowledge and information are not the same thing, this is almost beside the point when discussing the difference between these two areas. For the sake of argument, let's just call what's purportedly being managed "stuff." What makes the discipline of KM different from that of information management is that the latter focuses on finding the stuff and moving it around, while the former is also concerned about how people

ILLUSTRATION BY STEVE PICA



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Ask the Expert

create and use the stuff. Furthermore, information management is usually, though not always, concerned with electronic and paper-based information, while knowledge management deals with a far broader range of approaches to communicating and using both knowledge and information. KM is also made up of a whole range of soft issues that involves fostering an environment in which knowledge and information are shared and new knowledge is created. In short, information management is a subset of knowledge management.

Q: Could you speak to the topic of resources for ongoing management and maintenance of a knowledge management system that is worldwide in scope?

Management often fails to see a KM need, because when they need information, they generally just ask a subordinate, and it miraculously appears.

A: If by knowledge management system you mean some kind of information repository that members of the organization contribute and have access to the “organizational brain,” these things don’t run on autopilot. In large global organizations, the infrastructure required to maintain a well-oiled KM system are enormous. Technology support is needed not only to keep all the servers housing information in working order but to develop databases and websites as well. The human infrastructure also includes a host of people to maintain information currency and a consistent taxonomy within the KM system.

Q: I represent senior IT management for an organization that delivers local government services to small, impoverished communities in British Columbia.

Most KM case studies showcase large levels of government, such as in New York or California. For these small communities, examples on those scales are utterly irrelevant. How can I bring some understanding of using KM to improve local government services to other senior management in my organization?

A: Not all KM initiatives have to span mega-organizations. By the same token, not every organization needs an IT-based KM sys-

tem. Our advice would be to find someone outside of IT with whom to partner and codevelop a pilot project.

Q: We are implementing knowledge communities to bring our people into the equation. What strategies have you used or heard of to get employees to participate?

A: Bringing people into the equation is always a good idea. But if you have to force people to participate in communities, you do have to ask yourself whether they’re necessary. Not long ago, we directed a study of online knowledge communities (OLC) where we looked at what it takes to get people to participate. An online community will work only if it serves the needs of mem-

bers, not if it simply serves the needs of the larger organization. The acid test: Does the OLC help members do their work better? We’re also fond of quoting our former colleague, Joe Cothrel: “There are things I’ll do only if they’re mandatory—like my time sheet. There are things I’ll do regardless of whether

they’re mandatory—like organize my files. And there are things I’ll do only if they’re voluntary. Participating in a community is a little like that.”

Q: Do you have any information on the general education and salary range of a chief knowledge officer (CKO)?

A: We did a little digging for you. Roughly speaking, CKOs in companies with revenues under \$100 million have MBAs, JDs or PhDs, and their base salaries range from \$125,000 to \$225,000. In companies with revenues above \$100 million, CKOs generally have PhDs and a base salary of \$200,000 to \$350,000. CKOs in both large and small organizations also usually receive some company stock in addition to their base salary.

Q: Do you see enterprise portal technology facilitating KM?

A: It seems to us that portal technology is overhyped. Clearly people in organizations are overwhelmed by the amount of information available to them. Solutions that help them organize information and customize and personalize access to it are critical. To this end, portal technology can be a real boon to KM—portals are a way for people to make sense and order of their information environment. We would just add the caveat that having a portal strategy doesn’t mean you have a knowledge strategy. **CIO**

If you would like to recommend an expert or suggest a topic, e-mail Senior Writer Daintry Duffy at dduffy@cio.com.

Ask the Expert

Have a question about online customer relationship management (e-CRM)? **Rob Neville**, cofounder and co-CEO of Austin, Texas-based Evity, will be available to offer insight and advice on gaining loyal customers by giving them a great experience on your website. Post your questions for him now until July 31 at www2.cio.com/CIO/expert or e-mail questions to asktheexpert@cio.com.

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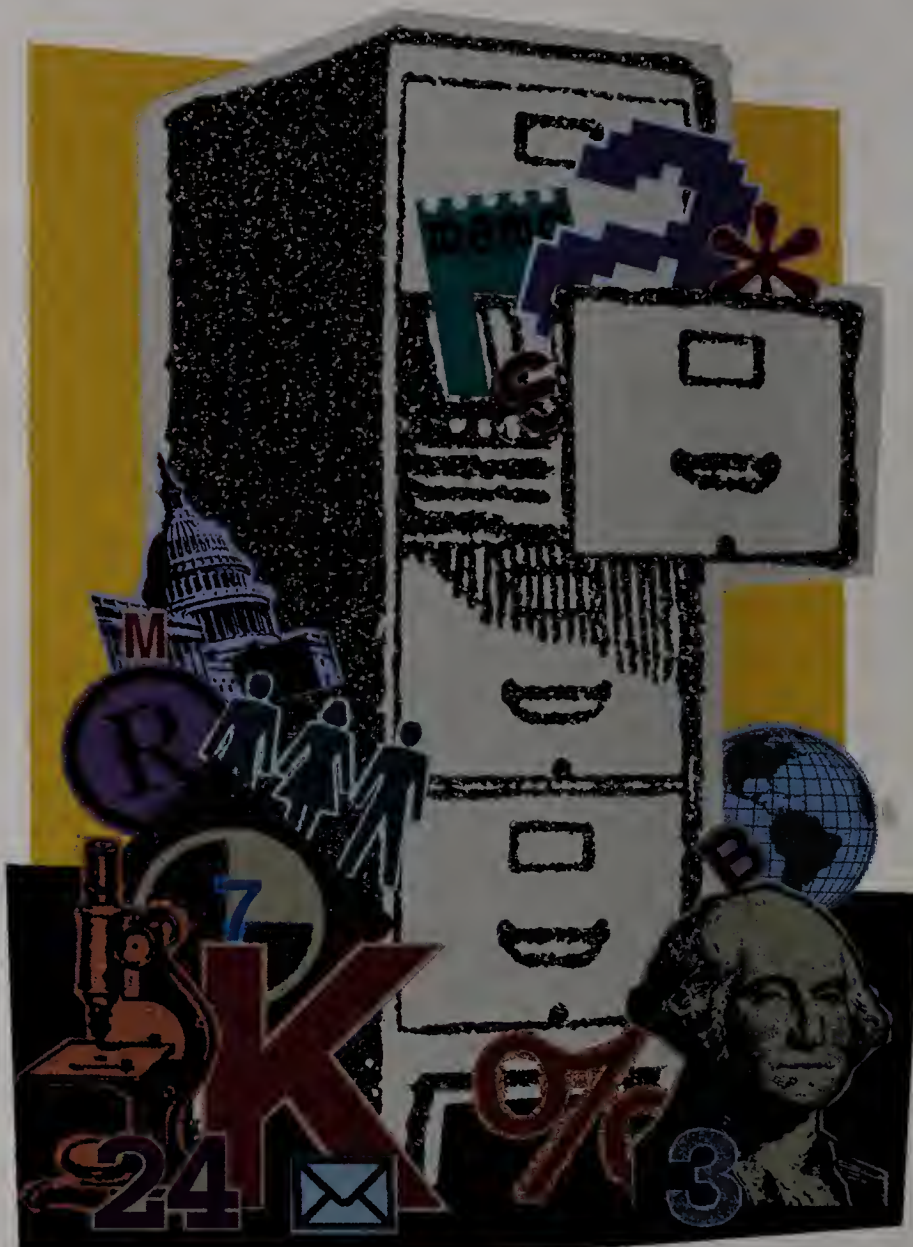
Document retention policies are crucial for keeping track of information and keeping out of legal hot water

BY BRETT N. DORNY

ONE INEVITABLE byproduct of the information age is, like it or not, an overabundance of information. Forget the intellectual challenges of information overload, I'm talking about the very practical matters of information disposition. What records should you keep and how should you store them? How will you find and retrieve documents once you've decided how long and where to keep them? More important, what kind of trouble are you going to get into if you do these things wrong?

Record storage and retrieval is a complex and expensive process, and different approaches seesaw with tradeoffs. The fewer records you keep the more time and resources you must put into selecting which to toss, but then finding things amid what's left is easier—and vice versa. Quantum increases in the capacity of electronic media have made storage much easier and affordable, but searching and retrieving more difficult.

These tradeoffs must be considered in light of cost and convenience, certainly, but also with an eye to legal requirements. It is too late to adjust retention practices once legal problems arise. To avoid problems, companies should develop and implement appropriate, written document retention policies.



Best Policy—Have a Policy

Any document retention policy's first objective should be to retain records needed to operate the company. Of course, the ability to *retrieve* desired documents has to be part of that. In addition, systems should account for two types of legal requirements: statutory compliance and potential litigation. That is, they should help you follow the law and be ready for a lawsuit.

Statutory or regulatory requirements promulgated by government entities provide explicit guidelines for storing records. For example, the Internal Revenue Service and the Securities and Exchange Commission have specific rules regarding what financial documents should be retained and for how long. Since the IRS can audit tax records seven years back, all tax-related documents should be retained at least that long. Litigation-related requirements, however, are much more complex, less explicit and more adaptable to specific company objectives.

ILLUSTRATION BY ALAN MAZZETTI

ARE YOU GETTING ALL YOU SHOULD FROM YOUR SERVER APPLICATIONS?



"Server certification was critical
to making everything happen
in Internet time."

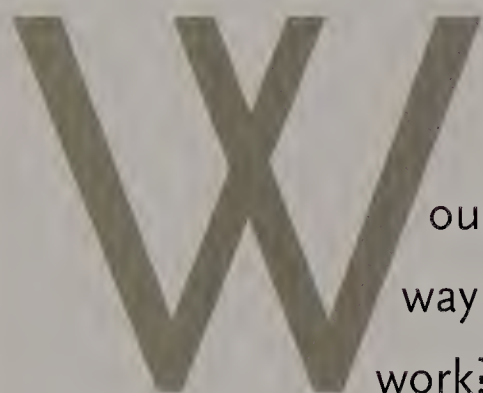
—Kennet Westby,
CIO of CornerDrugstore.com

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USERS FIND THE BEST PERFORMERS
ARE THOSE APPLICATIONS FINELY
TUNED TO THE OPERATING SYSTEM.

GET MORE FROM YOUR SERVER APPLICATIONS

The best performers are those
fine-tuned to the underlying
operating system



Wouldn't it be a change for the better if things simply worked the way they're supposed to—the way they've been represented to work? Take server applications. Consider the business benefits your organization would reap if the applications loaded correctly from the get-go and then worked together without needing significant testing or other time-consuming work from your staff.

With applications tuned to optimize and exploit the underlying operating system, you'd also see a reduction in the cost of enterprise-computing ownership. You could dedicate fewer person-hours to tracking down and fixing server-related mishaps. Bet you wouldn't miss the hours—or days, sometimes—spent playing phone tag with users and vendors, either. Instead, you would use that time to develop new, mission-critical business applications.

And that's just the beginning.

With Microsoft's® Certified for Windows® 2000 program, those

business benefits, and many more, are available right now. The stringent standards used in the certification program mean that all server applications that pass muster—those that bear the Certified for Microsoft Windows 2000 logo—will leverage the most important features of the Windows 2000 operating system to the greatest possible extent. Certified applications are designed from the bottom up to make your work life better by addressing key IT issues, such as ease of application deployment, lower total cost of ownership, and increased application reliability.

A VALIDATION OF QUALITY

Microsoft's Certified for Windows 2000 applications are designed to take advantage of all the enterprise-focused features of the underlying Windows 2000 operating system: Active Directory, a key element in helping to reduce administrative costs; standard install/uninstall procedures; user interface settings; and Security Services. Certified Advanced Server applications must also support clustering—in other words, those applications must be able to fail over and restart on a second server without disconnecting their clients. And server applications with client components

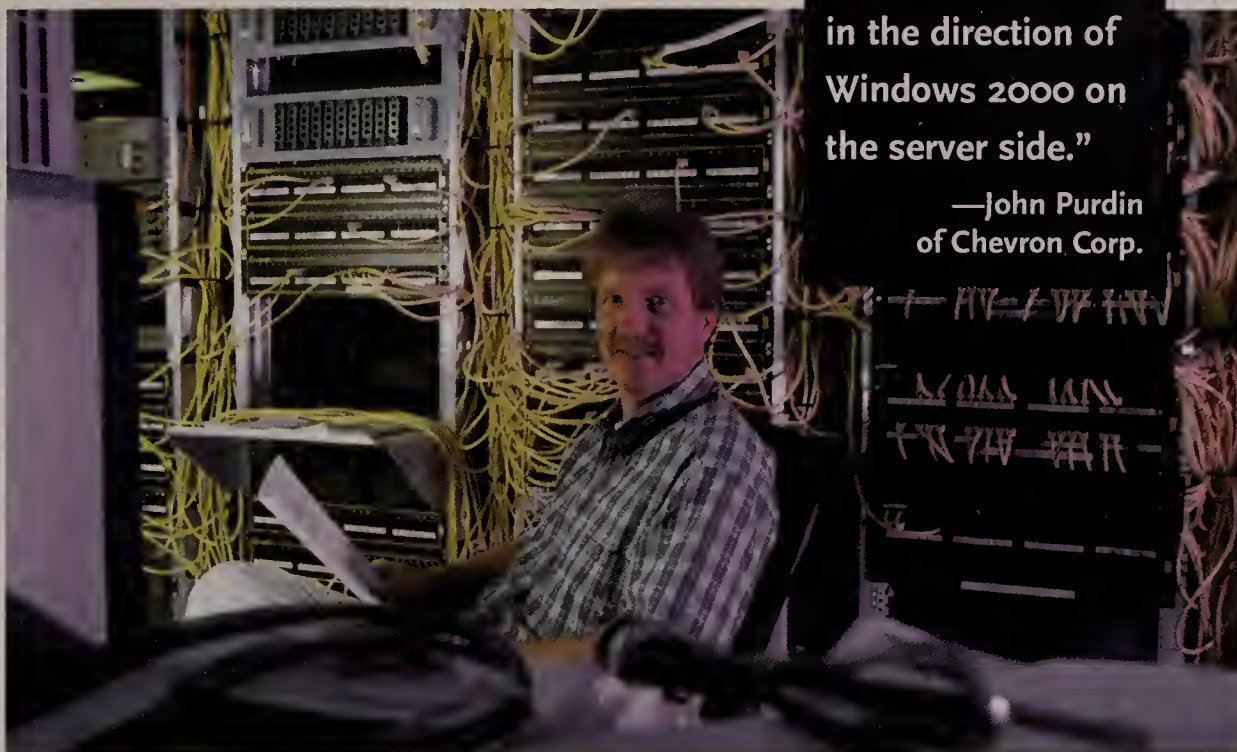
must meet the requirements in the desktop Windows 2000 specification as well as the server specification. (For more information about the specification itself, read "Testing, Testing," a list of FAQs, on page 12.)

Certification is a "validation of quality," says Rob Enderle, vice president of desktop and mobile technology at Giga Information Group, Inc. in Santa Clara, Calif. "It provides a higher comfort level for customers and can give peace of mind."

GartnerGroup, of Stamford, Conn., agrees. In a research note, analysts Michael Silver and Michael Gartenberg wrote, "In creating a strong logo requirement, Microsoft has made the logo valuable to enterprises, which will be able to use the logo as a condition for an application's use in the enterprise." And in the April 17, 2000 issue, *InformationWeek's* Aaron Ricadela said the certification requirements assure "IT departments that compliant software takes advantage of [Windows 2000's] remote software installation and system file protection features."

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"We want to move
in the direction of
Windows 2000 on
the server side."

—John Purdin
of Chevron Corp.

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KUDOS FROM CUSTOMERS

Customers ranging from established players to emerging dot-coms have already found significant business value in the Certified for Windows program.

"The specification makes it more predictable when we do business with vendors," says Darren Marelia, technical director of NT architecture and planning at Charles Schwab & Co. in San Francisco. "A lot of effort goes into making applications work with our environment—where they put files, what kind of security to expect when they run, how they interact with the desktop. If we buy a piece of software that doesn't adhere to the spec, we have to go through it and bring it into our environment and up to our standards. The specification means we have to do a lot less work when we bring in an application."

Kennet Westby, CIO of CornerDrugstore.com, has also seen big benefits from certification. CornerDrugstore.com, based in New York, is uniting independent pharmacies across the United States, helping them build their own Web pages with customized inventory and customer support. "Family pharmacists that have earned the respect and trust of

their local communities will now be able to service their neighborhoods over the Internet," Westby explains.

CornerDrugstore.com essentially bases its business on Pivotal Corp.'s eBusiness suite running on Windows 2000. Pivotal's eBusiness helps automate all facets of marketing, sales, and customer service relationships among partners, employees, and customers.

CornerDrugstore.com deployed Windows 2000 early last year, and went live with eBusiness in May. "Server certification was critical to making everything happen in Internet time," Westby says. "Pivotal's willingness to certify that all their applications and services would run in the Windows 2000 environment helped us make that choice," Westby says. "We didn't have to worry about it working." Because Windows 2000 was so new when CornerDrugstore.com was deciding which platform to use, the only other choice would have been to go with a different operating system and then switch after the fact.

"We didn't want to have to do that," Westby says. "It's difficult enough to get up and running as a business; the last thing you want is

to have to change your platform after the fact. Because of server certification, we didn't need to—everything worked as promised.”

He says he's “absolutely thrilled” with Pivotal and Microsoft—his technology partners. “We've developed a very

become subject-matter experts in the applications themselves. “If one of our departments goes out and buys software to do something, the IT group can administer it and be involved with data management without having to install the actual software,” Hill explains.

“It's difficult enough to get up and running as a business; the last thing you want is to have to change your platform after the fact. Because of server certification, we didn't need to – everything worked as promised.”

—CornerDrugstore.com's Kennet Westby

complex product in record time, and we're thrilled at the ability to offer this to our customers.”

Schwab, CornerDrugstore.com, and many others have discovered the powerful business benefits of relying on server applications that are certified for Windows 2000. Paul Hill, senior programmer/analyst at the Massachusetts Institute of Technology in Cambridge, Mass. and someone who helped create the server specification, says simply that certified applications result in “software that actually works.”

Certification is especially important on the server side, Hill says. “Being a nonprofit, we can't go out and hire hundreds of systems administrators to help run software that's poorly written. We need to distribute software to thousands of desktops without having to physically visit each of the desktops.” Certified server applications allow MIT to maximize its IT resources. Because each of the applications really does work, Hill explains, the software can work with Active Directory to centrally configure information and then deliver it to end users' PCs.

Another huge benefit, Hill says, is the ability to administer certified applications without having to

“It allows for an appropriate division of labor.”

Seattle Mariners LAN administrator David Curry agrees. “Server certification is important; we believe in it. Non-certified applications don't take full advantage of Windows 2000—and you do get warnings when you go to install those non-certified applications.”

SPEED AND EFFICIENCY: PRICELESS ASSETS

Among the business advantages customers buying certified applications have found—in addition to faster time to market, fewer hours spent chasing problems, and an overall improvement in the quality of server applications—are the following:

- A shorter learning curve when implementing the new operating system. Since many IT shops are still developing skill sets to allow them to maximize Windows 2000, using certified applications is a way to focus on the other things you need to learn—not on the applications themselves.
- Better use of your IT budget. In these days of record personnel shortages, you can apply your human resources to the places they're most needed.

- A shorter amount of time needed to test applications. Good IT managers will still do some testing, even of certified applications. But they will be able to do it in hours, not days.

- An overall smoother deployment of Windows 2000 and associated applications, with fewer problems and the confidence that what you're paying for will actually work correctly.

At the heart of all these benefits is the Application Specification for Windows 2000, with desktop and server components. Rich Clay, program manager at Microsoft, explains why Microsoft helped create the standard and the new logo program. “The prime criticism of the old logo program was that it didn't provide a high enough standard or the correct testing to be meaningful to the business customer. Microsoft's goal for Windows 2000 was to develop a specification in conjunction with our customers that contained requirements that really reflected what they needed and could be reasonably met by developers. In the end, we had a much higher standard test that made sure the software met that standard.”

DEVELOPERS AGREE

Judging by those who have been there, the application certification test suite is daunting, but achievable. Peter Wagner, chief executive officer of the Damgaard Group in Copenhagen, says, “We set up a special team for this,” with some 400 tests involved in the process.

Tom Kemp, vice president of marketing at NetIQ Corp. in Santa Clara, Calif., calls Certified for Windows “the most comprehensive software certification program in the industry that we're aware of.” He bases this on the number of checkpoints in the tests and the time it took in the testing lab to

APPLICATION ON PATROL

BMC Software's participation in the certification process has resulted in "a better product for the customer," says Greg Todd, program manager for Windows 2000 solutions.

BMC's product is PATROL for Microsoft Windows 2000 Server, and it provides a huge amount of systems-management functionality. Still in beta, it is scheduled to ship by the end of June 2000. The product is part of the PATROL 2000 product line, a broader integrated solution that enables the rapid deployment of advanced service level management.

PATROL uniquely allows for automated diagnosis of the root cause of failures and prediction of the impact of business change on the quality of service delivered.

PATROL is geared to provide high availability and performance of the server. If something goes wrong—a server goes down or is being utilized to its maximum

capacity—PATROL will alert the systems administrator via pager or console. But more than that, PATROL will take action to help correct the problem.

A lot of the new functionality in PATROL for Windows 2000 centers on Active Directory. PATROL delivers in-depth monitoring of Active Directory, a key part of the Windows 2000 architecture, ensuring that it's operating at optimum levels.

PATROL is, Todd says, "a well-behaved Windows 2000 application." This is, in large part, due to the certification process, he adds.

"When a customer installs PATROL, the files are laid down in the correct directory, there's standardization about how the start menus are placed, our agent is registered in Active Directory, and it follows the install/uninstall guideline," Todd explains. "Things aren't just lying around, causing problems later. The application won't be overwriting systems files and causing strange problems that nobody can find the cause of."

make sure everything was okay. But, he says, the time and effort it took to certify NetIQ's system management software was well spent. "It all leads back to happier customers," Kemp explains.

Mike Garcia, senior product manager at VERITAS Software Corp. in Mountain View, Calif., whose Backup Exec disk utility has passed through the certification process,

agrees that this program matters to enterprise customers. "We've gotten significant feedback from our customers that there's a distinct advantage when they know a product has earned the logo. They know they can buy and deploy with confidence, and that it will improve their chances of a successful rollout."

Roonj Uabhaibool, manager of worldwide networking services at

BMC SOFTWARE | With certification for Windows 2000 Server, BMC's PATROL product is more predictable and reliable.

**Greg Todd,
program
manager
for Windows
2000
solutions**



CRAIG H. HARTLEY/MERCURY PICTURES

Todd believes the product is better—more predictable and reliable—because of the certification process. "The features are more in line with what Windows 2000 customers will expect," Todd explains. "A certified application like PATROL simply works better."

More information about PATROL can be found at www.bmc.com/patrol. ▲



PeopleSoft Inc. in Pleasanton, Calif., is a Windows 2000 user and a huge certification fan. "Sure it's important—you want to make sure everything works well together, is reliable, and really leverages the new operating system. Otherwise, what's the point of going with Windows 2000—why not just stay with the old platform?"

Well stated. ▲



FileNET Corp. | Certifying Panagon
Content Services Server for Windows 2000
gives customers confidence

DOCUMENTATION MADE EASY

FileNET Corp. put its Panagon Content Services Server through the Windows 2000 certification paces "for our customers' sense of well-being," explains Matt Bogusz, program manager for content services. "We wanted to ensure that if our customers opt to move to Windows 2000, our application will go along with that, and they don't have to worry. It just makes it a whole lot easier for them."

The way Bogusz sees it, certification is a "step above" basic compatibility. "There's one level, where your product runs at least as well on Windows 2000 as it did before. But now the bar has been raised on features such as Active Directory, ease of use, and install ability. Our product takes advantage of those new features."

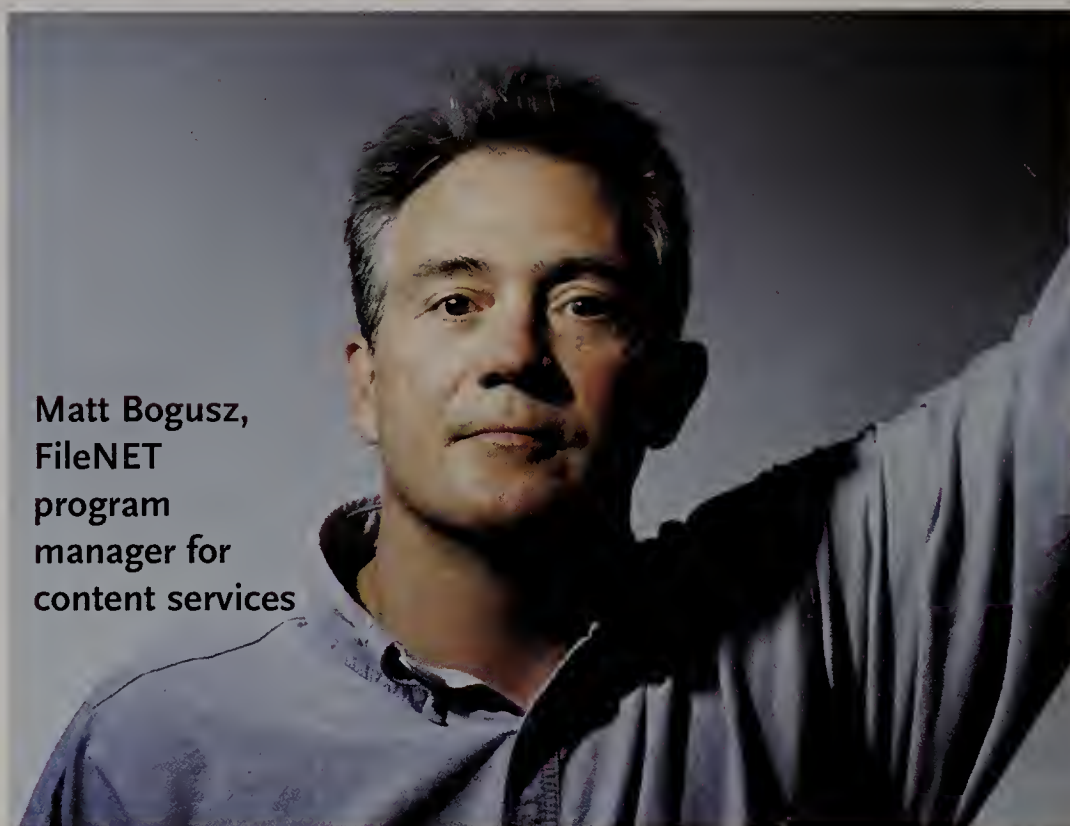
Nick Tuson, director of product marketing at FileNET, says, "Many of our customers have a heavy investment in and deep reliance on Microsoft technologies. Therefore,



FileNET
The Substance Behind eBusiness™

they want to feel confident that their applications will continue to support and work with newer versions of Microsoft tech-

nologies—they want to be sure their applications will continue to run in the Windows 2000 environment and really take advantage of



Matt Bogusz,
FileNET
program
manager for
content services

JEFF REINKING/MERCURY PICTURES

all of Windows 2000's features and functions."

Going through the certification process gives customers "the confidence of moving forward and planning their new environments, knowing we will support that environment as well," Tuson adds. And it's also a definite advantage to FileNET. "Customers want to talk to the partners that understand the new platforms. Certification helps," he says.

Panagon Content Services Server allows users to easily access, view, and manage massive amounts of business information stored in scalable, networked document

libraries. It supports over 200 document formats, including images, video, and compound documents that consist of pages "linked" together. Panagon Content Services Server manages dynamic electronic documents throughout their life cycles—from collaborative creation to secure delivery, revision, and re-use. In fact, FileNET uses its own family of Panagon software to help manage its Web site (www.filenet.com).

ENGINEERING DOCUMENTS TO MEET SAFETY REGULATIONS

Chevron Corp., the Houston-based petroleum giant, uses

Applications Certified for Windows 2000



Panagon software to help meet extensive government safety regulations. "There was a rule passed in 1992 that refers to plants and refineries that deal with flammable or hazardous chemicals," explains John Purdin, director of business development for Chevron's integrated document management solutions group. "You have to go through procedures to make operations available—you have to have engineering drawings, training that's up to date and documented," and a whole lot more, he says.

"We use Panagon to maintain the current released versions of our documentation as well as previous versions for retention purposes," Purdin says. These documents include material safety data sheets, engineering drawings, operating procedures, compliance audits, and many others. Some of Chevron's plants are using Panagon's Web-based services; others are not on the Web quite yet. But, Purdin says, "our direction is to move to all Web-based technologies."

They started testing Panagon 2000 in January, and have been impressed with its additional functionality. "We now have compound documents—word-processing documents with spreadsheets embedded in them—and we can create relationships between documents," Purdin says. "So we can relate a text document with an engineering drawing, and they're always linked."

Chevron is piloting Windows 2000 and will implement it in stages for both the desktop and the server over the next year or so. Purdin says he's looking forward to that. When Chevron adopts a new application, its current setup requires that Purdin's crew write scripts to install it. "That's a challenge," Purdin says, and he's look-

ing forward to using Active Directory to simplify the process.

"As we develop new document management services, we want to move in the direction of Windows 2000 on the server side," Purdin says. "It's more stable."

As the internal liaison for the certification process, Bogusz says

that "VeriTest [independent test lab] was very accommodating. They work with you in real time to help you make fixes to meet the requirements. The requirements are stiffer than they had been in the past for earlier logo programs, but we look at that as an opportunity to improve our product." ▲

AAG Inc.

Easy Web StoreFront

Alibre, Inc.

Alibre Design 1.0

Art Info (Arti)

Ideale 2000

Attachmate Corp.

Attachmate EXTRA! Enterprise

KEA! X Enterprise 2000

Attention System

ATTN Enterprise Management

AutoProf.com

Profile Maker

AVT Corp.

Right Fax

BMC Software Inc.

PATROL for Win2000 Server v2.0

BVRP Software

PhoneTools

Caere Corp.

OmniPage Pro 1.0

Ching Hang Information Co. Ltd.

Super Consultant #7

Cristal Software AG

Safir

Damgaard Group

Axapta v.2.11

Axapta 3.0

Datasweep Inc.

Advantage Suite

Executive Software Int'l.

Diskeeper Workstation 5.0

Diskeeper 5.0 Server

Undelete Server

Undelete Server v.2.0

Undelete Workstation

Fabasoft AG

Fabasoft Components

FileNET Corp.

Panagon Content Services Server

Gemplus Software

GemSAFE

Guru Software

GBA 2000I

Major Blue Company

MBM—Major Blue Marketing

Microsoft Corp.

Office 2000 Suite

Project 2000

Motiva

Motiva eChange Solutions

Navision Software

Navision Financials

Net IQ Corp.

NetIQ AppManager Suite v.3.5

NetIQ AppManager Suite Advanced Server

Operations Manager

Palo Alto Software

Business Plan Pro 4.0

PentaWare, Inc.

PentaZip

Pivotal Corp.

Pivotal eRelationship v.1

Prophet 21, Inc.

Prophet 21 Wholesale

PTC (Parametric Technology Corp.)

Pro/DESKTOP 2000I

Pro/DESKTOP 2000I2

Pro/ENGINEER 2000I2

Revit Technology Corp.

Revit 1.0

Scansoft, Inc.

Paper Converter

TextBridge Millennium Pro

TextBridge Millennium Pro Business

SolidWorks Corp.

SolidWorks 2000

Step Ahead Software

Steps Business Solution

Symantec Corp.

PC Anywhere

TIDAL Software

sys*ADMIRAL

TJ Group plc

TJ Planner

Trend Micro Inc.

PC-cillin 2000 7.0

VirusBuster 2000

VERITAS Software Corp.

VERITAS Backup Exec for Win Server

VERITAS Backup Exec for Win

Advanced Server

Visma Business AB

Visma Business

WACOM Technology

ECAD/dio

Wellan Systems

EOS Accounting System 1.0

WRQ, Inc.

Reflection for HP w NSVT

Reflection for AS400

Reflection for IBM

Reflection for REGIS Groupics

Reflection for UNIX and Digital

Reflection X

ISV

NetIQ | It took NetIQ more than a year to build the Windows 2000 version of its software. Going for Windows 2000 server certification meant getting the best return on its investment.

Building the Best Product You Can

Operations Manager, from NetIQ (formerly Mission Critical Software), monitors servers and service levels in Windows NT and Windows 2000. Based on an extensible COM architecture, Operations Manager features include real-time security monitoring, customizable consoles to display multiple system viewpoints, and the ability to act on a multitude of events that may occur.

Merrill Lynch & Co. uses Operations Manager to help manage some 16 VPN servers worldwide, says Peter Kaufman, assistant vice president in Merrill's technology and infrastructure services group in New York. Kaufman oversees the firm's remote-access servers. He likes Operations Manager because "at a glance, from a Web console, you can look and see how all your servers are doing."

Kaufman appreciates how easy it is to generate reports in Operations Manager, and how it allows for automatic e-mail or paging in case of a problem. "Our help-desk people use it too," he says, "because it writes events to a built-in database."

He says his group is migrating to Windows 2000 for two major reasons: because it fixes a major bug they had with a previous operating system, and because it provides for more simultaneous sessions per server. Also, Windows 2000 "will give us a centralized way to manage remote access policies," Kaufman explains. "If different people or groups have access to different resources, or are allowed to connect for different times with different encryption, Windows 2000 will let us manage and control all that."

Kaufman's group is currently testing Windows 2000 on about a dozen different servers with Operations Manager.

They shouldn't find any problems, since Operations Manager was "built from the ground up" to leverage Windows 2000 and its many enterprise features, explains Olivier Thierry, vice president and product manager at NetIQ. So it was natural for them to go for Windows 2000 server certification.

The certification process helped the company "find stuff we didn't find in our testing," Thierry explains. There were some issues when deploying Operations Manager with Windows 2000 and Active Directory that had slipped through the cracks, he explains. "But when you bring in a third-party testing lab, you get another perspective—and these are things we're very glad we caught."

It took NetIQ over a year to build the Windows 2000 version of Operations Manager, with "completely new code," Thierry adds.

The result of the certification? "We have a better product," Thierry says. "It takes a serious amount of work and design and architecture to make your software a certified Windows 2000 application—it's not something you can add in after the fact." ▲



**Olivier Thierry,
vice president
of NetIQ**

CRAIG H. HARTLEY/MERCURY PICTURES

ISV

NAVISION | The company always sought Microsoft certification for its products, but the Windows 2000 process was especially rigorous and well worth it.

A NATURAL EVOLUTION

"If we hadn't gone for certification," says Jais Agertoft, product manager for Navision Software in Denmark, "our customers would have made us do it."

That point was brought home at a recent sales meeting, where product managers from around the globe came together. "Everyone really feels this [Windows 2000 server] certification is very important to us," Agertoft says. "It adds stability, so customers know the application won't crash their server. And that's important, especially in business applications. Our customers can't afford any down time—and that's why we wanted to make sure everything works perfectly on the Windows 2000 platform."

Agertoft's company makes Navision Financials—a software suite that offers customer resource management, e-business, and human resources as well as financials. Navision serves 39,000 customers in 89 countries. Most of those customers are running

Financials on Windows NT, but Agertoft figures it's only a matter of time before they move to Windows 2000.

As it turns out, Navision needed no pressure to make the move to certification. "Since our very first Windows application, which we released in 1995, we have always had Microsoft certification for our products," Agertoft says. "So it was a natural evolution for us to go for Windows 2000 Server certification too."

However, Agertoft calls this certification process "completely different" from the logo-program testing he'd seen for earlier operating systems. "The requirements are much stricter in all ways," he says, and points out that although the certification process was quite a bit of work, it was well worth it in the end.

In the new version of Navision Financials that is certified for Windows 2000 Server, "we focused on the administrator role," Agertoft explains. "That person can now use Active Directory to administer all users, without having to have specific knowledge about Navision Financials." Because the application is so tied into Microsoft's server architecture, all administration—moving the user to another department, changing access rights, and so on—can be done through Active Directory.

There are a lot of benefits for the IT department with the Windows 2000 Server-certified version of Navision Financials, Agertoft says. "End users won't necessarily feel the difference, but the IT group will."

SEEING THE DIFFERENCE

One person who has already seen the difference is Ralf Månsson, the IT manager of Elbolaget i Norden AB, the Swedish electricity utility. The Windows 2000 version of Navision Financials has made their customer service much easier.

"We can shut down a server to do maintenance on it, and the users won't even notice. And if we expand our business with new servers, we can just add them—no problem," Månsson says. "What's more, it's a secure system. The clustering feature in Windows 2000 means that even if some chips or a hard drive blow up, we won't go down. That helps me sleep better at night."

Also, Navision Financials has helped Elbolaget serve its customers in ways not possible before. Utility workers in the call center now have centralized access to information the customers need; no longer must they jump among different screens.

"In the old days, with mainframes and minicomputers, you needed a team of men in white suits to guarantee constant availability," Månsson says. "Windows 2000 has made it inexpensive and easy for us to guarantee that the call center is always available." ▲

"Since our very first Windows application, which we released in 1995, we have always had Microsoft certification for our products."

—Jais Agertoft,
product manager for
Navision Software in Denmark

For more information on the certification process, contact the Technical Account Manager nearest you.

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THE CUSTOMER'S CHOICE

EXECUTIVE SOFTWARE |

Certification is a way to raise the bar for software quality and software development.

Now that Diskeeper, a disk defragmentation utility, has made the Microsoft Windows 2000 certification grade, "Our customers tell us that they use the Windows 2000 Server certification process as part of their selection criteria," explains Andy Staffer, director of research at Executive Software in Glendale, Calif., and the person responsible for the technology development of its products.

"It's a confidence factor," Staffer says. "Customers know this piece of software is doing what it should. When they deploy it on hundreds of servers, they'll know it works correctly."

That's what's motivating James Faircloth, director of information systems at C&M Medical Services, Inc. in Metairie, La. and a Diskeeper customer. "I want to move over to Windows 2000 on my servers, and I need something that understands Windows 2000 natively, without going through hoops," he says. For that reason, he will continue to use Diskeeper, as well as other Windows 2000 Server certified applications, as he transitions over.

Staffer characterizes the certification process as "very thorough." He notes that VeriTest was extremely supportive during the testing phases, helping Executive Software work out various kinks to ensure the product passed certification with flying colors. "The certification process raises the bar for software quality and software development. It just makes everything more robust."



Andy Staffer,
director of
research at
Executive
Software

ANDREA MAROUK

Robustness and performance are crucial to Diskeeper, since its claim to fame is helping improve system performance. The software takes files that are fragmented—stored in pieces on a disk—and makes the files contiguous. This increases performance, because the system no longer has to search all over to get the file's information; it's all in one place.

Diskeeper customers can't seem to say enough about the software's benefits. Claus Martel, command IT manager for the U.S. Army Aviation and Missile Command in Redstone Arsenal, N.J., counts himself a Diskeeper enthusiast. "We're at a military installation with over 7,000 users, and I've recently recommended to our Commander that we make Diskeeper a necessary part of our IT department's protocol when they install Windows 2000. It's a tool as necessary as anything else I have—I can't live without it!"

That's the kind of comment that makes Andy Staffer believe that the efforts needed to make Diskeeper become Windows 2000 Server certified were all worthwhile. ▲

BUT WAIT, THERE'S MORE!



**THESE COMPANIES WERE AMONG THE
FIRST TO HAVE THEIR APPLICATIONS
CERTIFIED FOR WINDOWS 2000
SERVER AND/OR WINDOWS 2000
ADVANCED SERVER.**

PIVOTAL CORP., Kirkland, Wash.

Its certified application is Pivotal eRelationship 2000, which automates all facets of marketing, sales, and customer service relationships among partners, employees, and customers. Pivotal calls its market "eBusiness relationship management"—it's a whole new class of business-to-business interaction on the Internet. Gord Breese, director of strategic alliances at Pivotal, says his company went through the certification process because "We knew it would dramatically improve our ability to serve our customers in the most demanding systems environment."

DAMGAARD INC., Atlanta, Georgia

Its certified application is Damgaard AXAPTA, a complete and flexible ERP system that includes its own development environment, called MorphX. AXAPTA includes all the functions a mid-sized company needs to run its business—financials, sales orders and purchase orders, logistics, production, and project management, among many other modules. AXAPTA remains the only ERP system certified for Windows 2000 Server. "As customers deploy, they'll be much more focused on certification," says Daniel Bebert, corporate product manager of technology at Damgaard. "And we'll be ready with manageability, scalability, and reliability. ERP systems that aren't certified will look kind of old and impractical."

VERITAS SOFTWARE CORP., Mountain View, Calif.

Its certified application is Backup Exec, a backup and restore facility for the entire Windows 2000 system, including Active Directory, COM+, Registry, system vol-

ume, and system files. The new Windows 2000 file system changes, including disk quotas and encrypted files, are also fully protected. Eugene Outler, engineering program manager for Backup Exec, says, "We've found in discussing things with customers that certification is most important in areas where customers have limited resources or are on a fast deployment track. We've heard that anything they can do to reduce the learning curve will help."

NETIQ CORP., Santa Clara, Calif.

Its product is NetIQ, a systems management solution that monitors the system performance, reliability, and availability of over 30 distributed Windows NT and Windows 2000 servers. NetIQ is certified on both Server and Advanced Server, meaning it supports cluster services for enhanced scalability and reliability. It also monitors Active Directory to track key statistics, including replication traffic and the growth of Active Directory data. Tom Kemp, vice president of marketing at NetIQ, says there are "a number of payoffs" to certification, the most important being continued customer satisfaction. "Customers will feel confident deploying our product in a Windows 2000 environment. It will be more reliable" than applications that aren't certified, Kemp says.

MOTIVA, San Diego, Calif.

Its certified application is Motiva eChange Solutions, a design change management product for manufacturing companies. The software allows manufacturers to manage and automate product change among business teams, supply chain partners, and customers. It helps with input, review, approval, and publication of design changes and advanced configuration management. eChange is also integrated with CAD solutions and with other core business systems, including ERP and customer relationship management. With more than 180 customers in the United States and Europe, Motiva eChange Solutions are at work in some of the largest manufacturing companies in the world, including 3M, ALCOA, British Telecom, Nissan, Pacific Gas and Electric, Pilkington Glass, and Shell Oil. ▲

FAQ

TESTING,
TESTING,

Q *Why should I believe this isn't just marketing hype?*

A The certification program is based on a comprehensive specification developed by end users and others. The specification covers the core set of enterprise server features and functions in Windows 2000. VeriTest, an independent PC testing lab, administers the program. Applications earn the certification from VeriTest, not from Microsoft. GartnerGroup claims that using applications that conform to the certification specification will result in lower total cost of ownership. GartnerGroup even says it makes sense to follow the application specification for development of homegrown applications, too.

Q *So how does an application pass muster?*

A There are 700-plus pages on VeriTest's site that cover the specific tests run on the application seeking to be certified. In broad terms, the tests include: Windows 2000 fundamentals (32-bit support, core application stability, long file names, etc.); install/uninstall procedures (certifying that the application doesn't try to replace files that are protected by Windows File Protection and that it installs shared files in the correct locations, etc.); user interface fundamentals (certifying that the application supports standard sizes, colors, font settings, etc.); Active Directory (which checks how the application uses Active

Directory's objects and schema, etc.) and Security Services (which checks support of single sign-on required for certain types of applications). Advanced Server applications must also support Cluster Services (they must be able to install on two nodes and support failover, etc.).

Q *How did this specification come into being?*

A For more than two years, a team consisting of 10 major user organizations, several independent software vendors, and Microsoft worked to produce the Application Specification for Windows 2000. The purpose of this detailed specification is to ensure that the applications certified under its rigorous standards fulfill the promise of Windows 2000 for stability and performance. The specification is a roadmap for building highly reliable applications for Windows 2000, and certification is a guarantee that the application will fully exploit the benefits and new features of Windows 2000.

Q *What else is interesting about the certification program?*

A There are many resources that go into making this happen. Server application vendors pay to test their software—the amount varies depending on the kind of application being tested. There are nine full-time employees in Microsoft and partner labs, called Technical Account Managers, dedi-

Why “Certified for Windows” is a real specification and testing plan that you'll want to know about for your IT shop.

cated to helping developers pre-test their applications. They also give on-site presentations about certification.

Q *How can I find test results on each certified application?*

A While the detailed results are confidential, VeriTest does post summary documents for each application. In these documents, end users will find important notes regarding support for the Application Specifications for Windows 2000. You can view these documents at www.veritest.com/certified.

Q *Where can I get more information?*

A There's a lot of information about the program available online. The certification home page on Microsoft's site is at <http://msdn.microsoft.com/certification/>. You can read the server and/or desktop Application Specifications for Windows 2000 by going to <http://msdn.microsoft.com/certification/download.asp>. Also check out VeriTest's site, at www.veritest.com. ▲



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All companies hope to avoid litigation; however, the difficulties that can result from failing to prepare for it mean you have to do more than keep your nose clean. Litigation-related considerations are essential to a good record retention policy. Several recent cases illustrate this point. During the antitrust prosecution of Microsoft the government was able to obtain documents from Microsoft, including e-mails, that suggested the company was acting in an anticompetitive manner. Also, judges have slapped Wal-Mart Stores with sanctions as large as \$18 million for withholding and destroying documents in connection with various lawsuits. Similar problems occur for

Even if the data still exists, if it cannot be located or effectively accessed, then it is as good as destroyed.

any company embroiled in unintended litigation. Following a proper document retention policy can avoid such problems.

Although top management usually establishes a document retention policy, the CIO has a significant role based on the move to electronic documents. Any policy must be feasible given the company's personnel and equipment, including information systems. Furthermore, the locating of records during litigation will often fall to the IS department, which maintains the records. Thus a CIO's input on the creation and content of a document retention policy is in everybody's best interest.

Document Your Good Intentions

Spoliation is the intentional destruction of evidence that is material to an ongoing or imminent litigation matter. During the regular course of business, many records and documents are destroyed. E-mails are deleted. Files are erased. Paper documents are shredded or thrown away. But if a court finds that documentary evidence was improperly destroyed, sanctions can be imposed. All of a party's claims or defenses could be denied. The jury could be instructed to infer the content of the destroyed documents in a manner adverse to the party who destroyed them. Significant fines could be imposed.

When documents no longer exist, indications of the party's good intent in their loss or destruction can help prevent penalties. Evidence of having followed normal business practices can show good intent. Assertions of a lack of intent to destroy documents or indifference to destruction, on the other hand, will not help you avoid sanctions.

Any document retention policy should include alternate practices for times of ongoing litigation. Spoliation standards allow sanctions when relevant documents are destroyed after a suit was filed, or when a suit is fairly perceived as imminent.

Needles in Haystacks

The second consideration for a company hoping to survive litigation is its ability to locate documents that prove its own positions. Computer files are often haphazardly organized and stored; such random storage increases the costs of litigation. In most cases, each party bears its own expenses of discovery, including production of documents. That is, you, not your opponent, are responsible for sifting through a large amount of irrelevant material to find information that is important to you or that has been requested by your opponent. You may incur expenses up to \$100,000 or more, reviewing electronic documents required by an opposing party.

Often documents from relevant time periods are necessary to corroborate your position. Even if the data still exists, if it cannot be located or effectively accessed, then it is as good as destroyed. A data retention policy that manages electronic information can save a company time and expense because proper documents will be retained, and can be easily located.

Technology's Inconstancy

The third reason to implement proper document retention procedures is simply to avoid the side effects of technological advancement. A company may scrupulously maintain its electronic information but find it is unable to access it when it is ultimately needed. Software programs change, and data created and stored using a prior version may not be easily accessible.

When companies completely change software platforms, old data may be inaccessible after the changeover. During litigation, a party may have to spend a lot to retrieve data hidden away in outmoded programs. Plan how to access old data at the time software changes are made rather than years later when the alternatives are fewer and more expensive.

Keep in mind that even though electronic files may be deleted, network servers may have backup tapes that include those ostensibly deleted documents. Accordingly, any document retention policy should address the length of time that backup tapes are retained. Finally, remember that today coworkers are spread around the world. Records may be retained on hard drives by individuals, even if deleted elsewhere as per policy. The best laid plans are always defeated by someone who did not get the message. **CIO**

Brett Dorny is of counsel in the Boston office of Mintz, Levin, Cohn, Ferris, Glovsky and Popeo PC, where he specializes in intellectual property law. E-mail us about legal matters at fineprint@cio.com.



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Career Counsel

Mark Polansky Offers Advice to Aspiring CIOs and IT Managers

Don't Ask, Don't Tell

Q: I have been with my company for eight years, and I relocated a year-and-a-half ago to the corporate office when the local office was closed. I perform team leadership and contract management functions, I am MCP, and I will finish my MBA this summer.

My family wants to move back home before fall, and I'm not sure if I should inform my company that I'm looking for another job and will be leaving, or wait and tell them after I have a job in hand. I think I should give them time to make arrangements, but my wife thinks I should wait until I've found a job. Should I tell my company I'm looking?

A: Your wife is right. Exposing your intention to leave, some six months prematurely, will certainly put you in jeopardy of losing your current relationships, responsibilities and authority on the job, not to mention your credibility since nobody will understand the reason you're leaving. Your obligation to your employer is to ensure continuity and succession within your span of control, whether or not you resign next fall or get hit by the proverbial truck tomorrow. Additionally, when the time

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comes for you to move on, you are obliged to leave your employer and your own domain in great shape. Given your obvious sense of diligence and loyalty, I feel confident that you will do that very well. Lastly, you can remain accessible to your successor and former superior and peers in case they need your help after your departure.

WHAT'S IN A RÉSUMÉ?

Q: I've read several books on résumé preparation for high-end positions, and I feel that my résumé has been cast in a manner that is consistent with the advice provided. I also sought the assistance of a national and well-respected company that specialized in executive résumé preparation. With all that, the typical response that I am receiving is that I am either too technical or they are very impressed, but something's missing. What could I be doing wrong?



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A: If the “too technical” or “impressed but...” responses follow a reading of your résumé, then you are indeed too technical or you have inadvertently portrayed your experience that way—or there is something else on your résumé that is turning the reader away, something that the reader can’t or won’t acknowledge. It could be a legitimate concern like your job history, the places you have worked, your education or an illegal issue like gender, age, religion and so on. To guard against the first possibility, read your résumé again, very slowly, and ask yourself what impression each and every entry might tell a reader about you—then get a trusted third party to do the

Compensate for your lack of technical expertise by leveraging your business knowledge and strategic planning skills to create strong value IT.

same. Unfortunately, there’s no way to guard against the latter possibility. If on the other hand, the “too technical” or “impressed but...” reaction comes after a face-to-face meeting, then look to develop and polish your interviewing skills and try to discover what’s holding you back.

A FORK IN THE ROAD

Q: I have an opportunity to take one of two jobs. The first is as IT operations manager of a small but fast growing company that develops software for marketing resellers of all product types. The intent is to groom me for the IT director position.

The second is with a top company in e-billing services as director of distributed systems. However, I would have to compete with four other candidates for the next promotion—vice president of IT operations. In your opinion, which position should I take in order to stay on track for a future CIO position?

A: It is difficult to answer you definitively from the little information you have provided, but let’s give it a try. If I’m not mistaken, the first situation sounds like an internally oriented responsibility for IT operations, keeping the infrastructure running smoothly and managing the company’s enterprise transaction and information applications processing. This sounds like it might be a prelude to an IT director position and if so, may be quite appropriate in keeping with your CIO goal.

Alternatively, the second option looks like a chance to manage distributed systems—also presumably the IT infrastructure and operational aspects—for a leader in the very hot e-billing space. This experience will surely keep your skills and

knowledge current and timely. In the big picture, I would advise you toward the latter choice—it may be more competitive but will be a better opportunity for building your résumé in e-business content value, while still offering you comparable management responsibility.

THREE-LEGGED STOOL

Q: I have an opportunity to move from a financial executive position at a subsidiary company to a newly created CIO position at the parent company. As the new CIO, I will assist in a worldwide reengineering program and implementation of new systems to support the new business model. I have had prior IT experience through responsibility for management of staff and consultants maintaining proprietary software; implementation of a network environment; selection, negotiation and implementation of an ERP system; and reengineering of a business model in expectation of the ERP implementation.

However, I’ve had limited involvement in the three legs of IT (technology and architecture, operations and technical support, and application systems development and support) that you mentioned in response to a past question. Will involvement from an executive level compensate for the lack of lower-level technical experience, or will it impede my ability to move to other organizations in a similar role in the future? Overall, would you consider this a good move?

A: Yes, I would recommend the move but only if you are certain that you will truly enjoy being a CIO and having a CIO career, or if a turn as CIO is part of your plan to acquire a broad base of experiences in preparation for general management.

Your prior IT experience, especially your role in the ERP implementation, is clearly part of the “applications systems development and support” leg of the stool, and it appears to be highly applicable to the short-term mission of the new CIO position. So you are in the game.

I also agree that your lack of prior technical experience is a handicap as a CIO, both in the current situation as well as at any future employer. You can compensate for this hole in your background by leveraging your business knowledge and strategic planning skills to create strong value for your IT function, and by utilizing your financial expertise to put forward a strong business case for each of your IT initiatives based on compelling returns on the investments.

Most important, seek out and hire the very best lieutenants you can find to serve as trusted deputies to manage the infrastructure and operational aspects of your new domain, either in-house or through the very best outsourcing solutions available to you. In either case, this will minimize your experience gap and leave you free to focus on the strategic value of your responsibilities.



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Career Counsel

A FELLOWSHIP ROLE

Q: I am a senior-level IT manager for a large beverage company that I have been with for 15 years. I am 40 years old and have an MBA. Most of the company's IT staff is moving—including my function—and I recently declined a transfer because of my family's desire to remain in this geographic area.

To my surprise, in an effort to keep me, they have offered me a senior technical fellow role doing special projects in emerging technologies in my present location. I feel this would be fine for a future in consulting but am concerned that stepping out of the management path will present a problem if I want to change companies in the future. Is this advisable, and how long is too long to stay out of management?

A: First, recognize that you have been paid an enormous compliment in the form of an offer to remain with the company, as a senior technical fellow, while maintaining your present residence. Good for you! You have obviously made a signifi-

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cant contribution in your 15 years of service, and you are quite right that they don't want to lose you.

As far as which might be the right path for you—transfer, stay on or move on—that all depends on your personal and professional priorities, and what you want from your career and your life going forward. The first option, to take the relocation, has already been eliminated by the family's desire to stay put. A tougher choice is whether to take the reassignment doing special projects in emerging technologies or to seek a new management position at a new employer.

If you enjoy management and are very good at it (which I suspect you are based on your track record with your current employer and the MBA) then perhaps this is a good time to move on. Any significant hiatus from management will make it tough to get back in at a latter date, and the longer the digression the tougher it will be. Many potential employers will always assume that you gave up management for additional reasons other than just the company's move. And the senior technical fellow title may brand you as a solo (ivory tower?) technologist rather than a business-driven leader.

The market for talented IT management is hot and will receive your credentials anxiously. And after all, it has been

15 years, and judging by your age, you've had pretty much a one-company career. So why not play in a different pond or even another industry to give your experience some new breadth and yourself a new challenge?

CIO QUALIFICATIONS

Q: I am a young, technically oriented individual seeking a CIO opportunity. I have a developing opportunity that I believe will give me the chance to create an IT department from scratch. The company I am currently with has a nontechnical person fulfilling IT duties. The company, and consequently the head IT position, is rapidly expanding.

Is the path of creating an IT department at a small but growing organization a valid direction toward an eventual CIO position? And what is the definition of a CIO, as I will likely be required to define the role to be filled first? I would like to determine whether I would qualify for the title of CIO before any other kind of promotion.

A: It sounds like you may be at the right place at the right time to take advantage of your employer's rapid growth. The company's expansion will likely create an opportunity for you in IT management. Perhaps it will be the top position, or perhaps you may play an expanded and key role in the IT function and still report to the top person currently in place.

Now there are three questions that need to be addressed. First, do you truly want to be a CIO? You refer to yourself as a "technically-oriented individual," so let's be sure that it is the strategic role of a CIO that you are focused on, rather than a systems or infrastructure management position that you truly seek. Second, do you have the experience and skills or at least the aptitude required to succeed as a CIO? Don't set the CIO goal for yourself simply because it sounds good, and then fail or be unhappy in that role. And third, does your growing company get it? Do they want a CIO who can contribute to the enterprise's strategic plan and create operational excellence and competitive advantage through investments in the application of technology? Or will they settle for a director to run IT solely as a support organization.

Proceed straight ahead if all three answers are positive. Otherwise, slow down and take each step as it moves you in the right direction for both you and your employer. **CIO**

Mark Polansky is a managing director and member of the advanced technology practice in the New York City office of Korn/Ferry International. He is also the chairman of the Greater New York Chapter of the Society for Information Management. The Web-based Executive Career Counselor column is edited by Web Research Editor Kathleen Kotwica. She can be reached at kkotwica@cio.com.



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The database vendor insists it's the servers.

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The IT director wants to know who's
responsible for making all this stuff work together.

After a long, ugly pause, the guy next to her
whispers into her ear, "You are."

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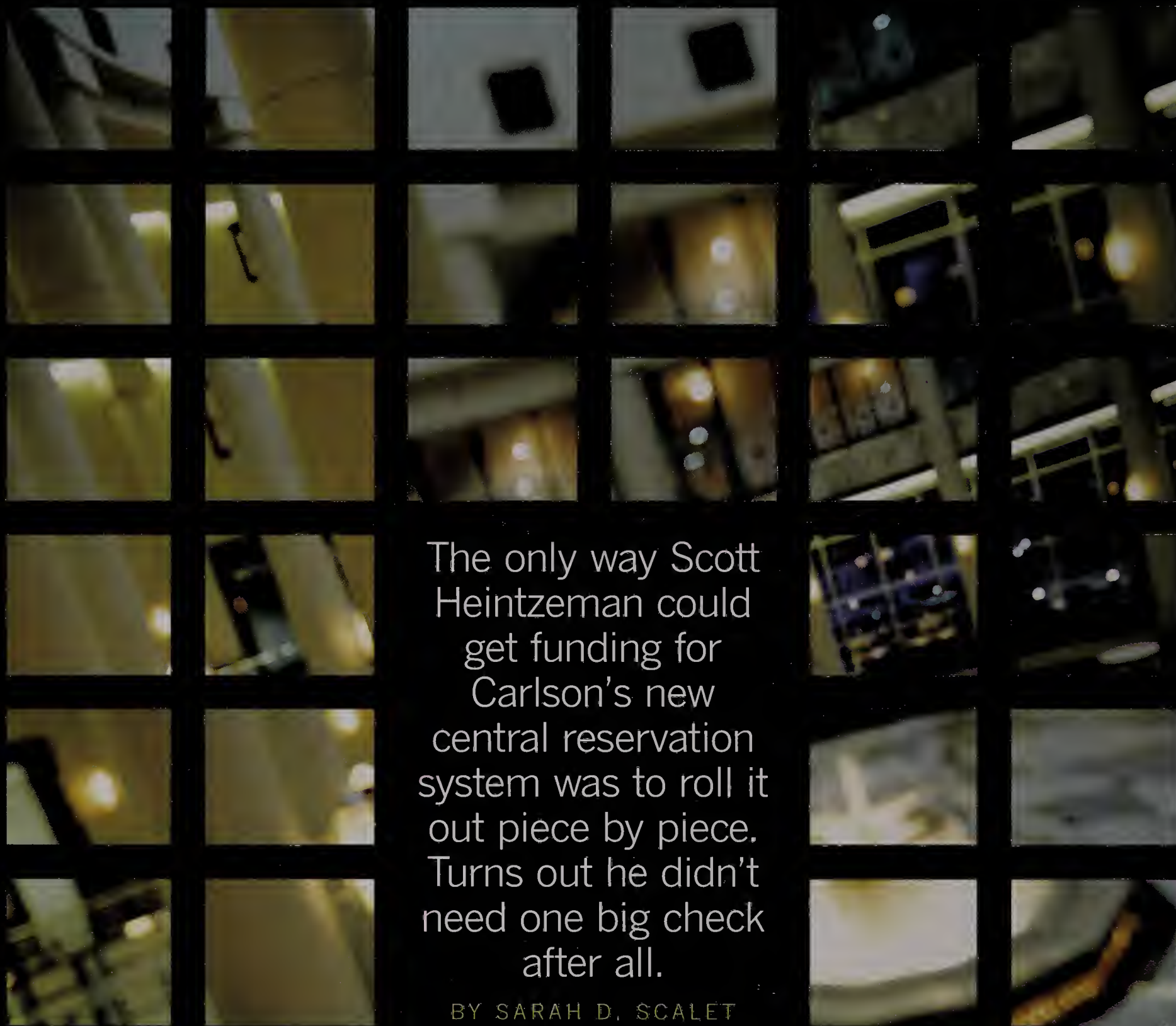


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The only way Scott Heintzeman could get funding for Carlson's new central reservation system was to roll it out piece by piece. Turns out he didn't need one big check after all.

BY SARAH D. SCALET

PHOTOS LEFT AND RIGHT BY MARGO BERLIN

STAGE

In 1995, Carlson Hospitality Worldwide was on a roll.

The company had patented an incentive plan for travel agents, created a standard-setting, seamless interface between travel agents and the central

reservation office and capped off a decade of adding a new hotel, mostly under the Radisson flag, every 10 days. The company's central reservation system (CRS), then bringing in 40 percent of the annual room revenues from those Radissons, was humming away at the heart of the business. "It was heresy inside our

company to say that there was

anything wrong with our reservation system," says Scott Heintzeman, then vice president of knowledge technologies, who was recently promoted to CIO of Carlson Hotels Worldwide.

Ahem. The tech guy has some news.



CIO **Scott Heintzeman** gave his board the bad news: They needed a new reservation system.

Managers

"I remember coming into one of the board meetings and saying, 'You're not listening to me. We need a new rez system platform. Technology is changing, there's this thing called the Internet, there's the kiosk thing, there's interactive TV, and we can't handle any more growth,'" Heintzeman says. "I told them, 'Your system is over in two years.' And they were furious." Not long before, AMR Information Services, Budget Rent a Car, Hilton and Marriott had abandoned Confirm, a multimillion-dollar effort to build a CRS. Eyeing headlines about this stunning failure and fearing a similar fate

at Carlson, the board of directors held meetings without Heintzeman. "My job was in jeopardy," he says. The board hired consultants, trying to prove Heintzeman wrong, to prove that he was deluded or self-serving, to prove something that couldn't be proven—that the 10-year-old reservation system would last forever.

When the IT team asked for \$15 million to build a new CRS, recalls Steve Medina, director of application development, the answer "wasn't really, 'No thank you,' so much as, 'Hell no.'"

Heintzeman and his team returned to the

drawing board and came back with a solution they call "chunking." Instead of a one-shot revamp of the entire system, the team plotted to split the overhaul into discrete bundles of work. Each task had a direct business benefit. No step could set up a prerequisite for the next step. And none of the projects would require major rework with any future step. These principles of chunking did more than address funding concerns. At reservation centers, extra minutes of downtime can add up over the course of a year and translate into millions of dollars in lost revenue, so creating new pieces that were

Piece *by* Piece

Nine (or so) steps toward a new reservation system

CARLSON HOSPITALITY WORLDWIDE'S central reservation system (CRS) handles 3 million reservations a year via the Internet, travel agents in 125 countries and sales representatives taking toll-free calls from 51 countries. Curtis-C (pronounced "courtesy," a play on the name of founder Curtis L. Carlson) was built in stages or "chunks" with the help of the Minnesota-based consulting group Born Information Services. By design, each step was completely interoperable with the legacy system to protect operations crucial to Carlson's checkbook. Each step also had a name, so that team members could easily talk about what they were doing:

1 Oracle Common Database
Data migrated from a C-ISAM file system to a relational database. Carlson's IT executives compare this process to lifting a house, rebuilding its foundation with some extra rooms and putting the house back down—ready for a major renovation.

2 Decision Support System
Migrated month-end reports to a separate system.

3 Curtis-C Communication Manager Implemented a new system for delivering reservations and other information to hotels.

4 Harmony Database Manager Allowed hotels to start setting their own rates and controls instead of sending written notice to Carlson. About 200 of Carlson's hotels have this step, which fits in with the existing Harmony Property Management System that allows hotels to keep track of property information.

4.1 Automatic Rate Update Manager Allows the central reservation office to load all kinds of rate information. Also includes a rate shopper so that hotels can compare prices at other Carlson properties. Part of this step was not anticipated, and other parts were pulled out of chunk 6.

5 Bridge Interface Built a bridge between the Curtis-C Communication Manager and Harmony Property Management System so that agents need not make inventory changes in two places. Eighteen hotels are live with the bridge system, and new ones are constantly being added.

6 (Skipped) This step involved rewriting the interfaces that are written in the legacy code, Action 4GL. The new system uses Forte tools that work with the legacy code. Because that code still

works and because both the old and new applications share a common database, there's not yet a direct business need to complete this step. Action's provider, Action Software, went out of business, but Carlson's director of application development, Steve Medina, is a former Action employee, and the group has managed to hang onto another consultant from Action. So far, the acquisition of Forte by Sun Microsystems has not affected Carlson.

7 Curtis-C Voice System
Carlson has gradually unrolled a new voice reservation system. Commission-minded sales reps clamored for the upgrade, which will be completely rolled out by press time.

8 Web-Booking Interface
This step relaunched Carlson's website with a more advanced interface for making reservations.

Steve Medina, director of application development, believes in small, frequent updates.

compatible with a legacy system that was still bumbling along minimized Carlson's risk of losing money if the new system hit any hiccups. The board of directors could nix the rest of the project at any point without losing any of the benefits gained thus far. And as things turned out, the IS team could stay flexible as business and technology changed while the project was underway.

If the solution seems obvious, then you see the beauty of it.

Chipping Away at Imperfection

Once Heintzeman and his team established their plan, they managed to get funding for the first chunk, and soon they started rolling out the new CRS (see "Piece by Piece," Page 78, for a breakdown of the chunks). Along the way, they would insert one chunk and ditch another as needed to get the biggest payback, while staying open to suggestions and churning through 3 million reservations a year from 50-some countries. It was all part of the plan not to be wedded to the plan.

Aside from eight completed steps, the company can now count off its accolades—like an Industry Best Practice award from Cornell University, placement in the Smithsonian's permanent research collection and Heintzeman's induction into the Hospitality Financial and Technology Professionals' International Hospitality Technology Hall of Fame—but they'd rather wave you to a stack of press releases and talk about a term usually reserved for peanut butter.

"Chunking a project allows you to be more flexible as time goes on, as business priorities change, as you learn more about



what you're doing," Medina says. "If you try to do the whole project all at once, often you'll find that functions you focused on weren't what you really should have been focusing on. For instance, we're interested in voice recognition, but right now there are more significant business drivers." An exam-

ple of the payoff of flexibility: Medina says at the project's inception the group didn't anticipate the value of creating Web interfaces to the CRS.

Because of rapidly changing technology and a business pace quickened by e-commerce, working on a project in chunks or

"More money is wasted in IT today searching for the best tool—it's a moving target."

—STEVE MEDINA

“We believe **change control** works better when it’s not such a **formal process** as you see in most places.”

—TOM SIKYTA

subsystems is becoming a popular tactic, says Danek Bienkowski from the Project Management Institute (PMI), a nonprofit professional association. Speaking generally, he says this tactic does have trade-offs. “There’s always a certain amount of rework that you wouldn’t have had if you’d done [a project] in one piece,” says Bienkowski, cochairman of PMI’s Information Systems Specific Interest Group. Plus, the time needed to build interfaces between the new and legacy systems is sometimes overlooked or underestimated. That doesn’t mean Bienkowski isn’t a firm advocate of the concept, though. “You need to have much shorter deliverables,” he says, noting that some companies are breaking projects into chunks that can be completed in as few as 30 days. “The longer a project is, the more difficult it is to align with the business.”

Indeed, for the Carlson CRS team, underlying this chunking strategy is a strong belief that there is no perfect system—that it’s not even a good idea to aim for one. Purse holders may snap the purse shut if they don’t start seeing results pretty quickly, and perfection takes time. Also, a “perfect” plan might lack the necessary ability to change. Carlson never could have built, say, the final version of the old CRS from the get-go. “Systems evolve,” Medina says.

Carlson selected vendors along the way, of course—with less planning than might be expected. “More money is wasted in IT today searching for the best tool,” Medina says. “It’s a moving target. In the broad spectrum of tools that exist for any particular job, you really should only be interested in getting rid of the 20 percent on the boundaries that are completely inappropriate. It might sound a little cavalier, but you don’t need a perfect solution. When you get down to the shortlist, any of them will work.”

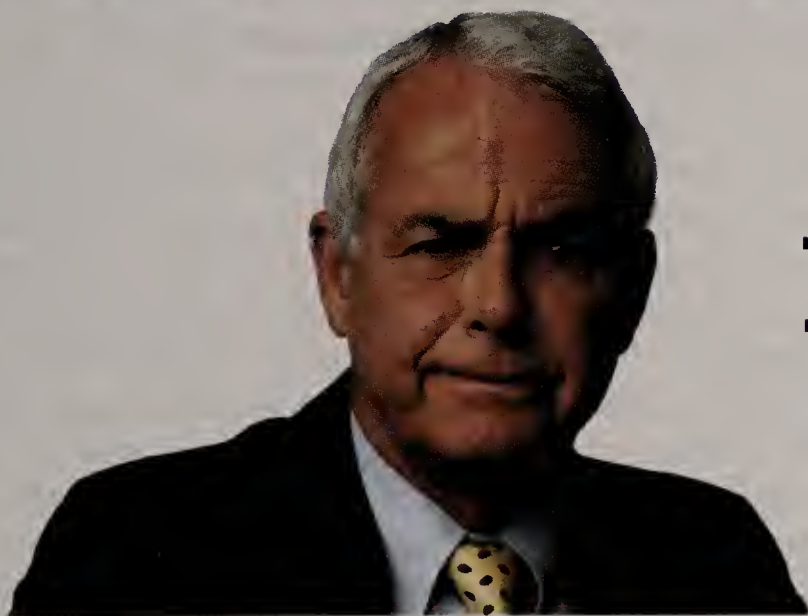


Or maybe not. Along the way, the group had to deal with a vendor change, from Hewlett-Packard servers to a Sequent (now IBM) NUMA-Q-based system. When Carlson made its initial choice, the team underestimated the horsepower the system would ultimately demand. HP at the time did not offer a big enough system, Medina says, so they made the switch. Another snag involved a latching problem with the Oracle database

Tom Sikyta, senior director of distribution systems, and **Becky Brechbill**, IT account manager for project management, help combine IT and hotel industry operational knowledge.

at the beginning of the project, which caused the CRS to come to a grinding halt for about 12 hours—the longest downtime throughout the project. The Medina moral here? “Help-

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desk support is OK for common problems, but when you have something different, you have to have a resource. Know who the real experts are. They're worth whatever the billing rate is."

Another key to the system's success—and the fact that team members say they could sleep at night—was that steps were done in a gradual rollout that could always be

main office in Omaha, Neb., and in satellite offices in Albuquerque, N.M.; Dublin, Ireland; and Sydney, Australia. Some experts might debate the wisdom of these continual updates and wonder about the risk of version mismatch problems. The PMI's Bienkowski warns that hundreds of changes flowing in at random intervals may become inefficient, but he says that's not always the case.

ion, users would rather deal with a big glitch for a day than a small one for six months. "The cost of a bug is a function of how long you have to live with it," he's fond of pointing out, noting too that the most expensive bugs are the easiest to find. "Even if it's a relatively minor bug, if you have to live with it for a long time, eventually it starts eating at your credibility. When we do an upgrade,

"When we do an upgrade, sometimes a bug is introduced. No problem. We'll do another upgrade in an hour."

—STEVE MEDINA

reversed. For instance, the new voice reservation system was initially installed on just 10 machines, and sales reps could toggle back and forth between the old system and the new. Becky Brechbill, IT account manager for project management, says they fell back to the old system only once, during the initial beta test. A hotel called to say that the CRS had delivered a reservation with incomplete rate information, and sales reps used the old system for 30 minutes while the IT team fixed the problem. "After that point, we never got to another situation where we said, 'OK everybody, back to the old,'" Brechbill says.

Making Changes

In addition to the concept of chunking, another central tenet of Carlson's new CRS is this: Rather than distribute huge updates once a year or so, make it easy to release small changes as often as necessary. Heintzeman sums up the approach: "You go for small, frequent, painless improvements."

Critics of the client/server computing model might mutter about the time and energy that's been spent on getting these fixes and enhancements to Carlson's users—the more than 600 hotels, 455,000 travel agents and 350 call center employees, at both the

At Carlson, the approach seems to have worked. At change control meetings twice a week, anyone on staff can discuss needed fixes and enhancements. During the first quarter of 2000, the company made about 500 hardware and software changes, with scheduling based on whether a change was standard, priority or emergency. "We believe that change control works better when it's not such a formal process as you see at most places," says Tom Sikyta, senior director of distribution systems. "I don't believe in the kind of process where a programmer writes a change and it gets submitted to some change control group and then three months later it gets implemented."

When an update is available, an icon appears on the user's desktop, and he or she can double-click it to download and install the fix. Updates usually take 30 to 90 seconds to download, and users are warned if a big update is coming. A copy of the file is now stored at a site in Europe, too, since download times had become a problem across the pond. "As much as possible we want to reduce the overhead associated with change," Medina says. This strategy of small changes is a rallying point—and one of Medina's strong opinions that might cause fellow team members to warn you that he's a man you'll remember meeting. In his opin-

sometimes a bug is introduced. No problem. We'll do another upgrade in an hour."

A Team that Works

As Heintzeman and his team work on chunks No. 9 and 10—a yield management system that will make predictions about reservations demand, and imaging capabilities that will allow reservations agents to see maps and pictures—they don't have as much trouble getting the board's approval. "We've had some blunders along the way but I think also some phenomenal success," says Heintzeman, sitting with the small team that came together about five years ago: Sikyta, who oversees the daily operation of the reservation center; Medina, who knows the legacy system and focuses on fitting the IT wish list into time and budget constraints; and Brechbill, who knows the hotel industry and makes sure the system's graphical user interface fits the industry's needs.

In the evening, Heintzeman will catch a 50-minute flight back to Minneapolis and Carlson Hospitality Worldwide headquarters, but the rez system is housed under the roof of this 80,000-square-foot brick building situated right where Omaha starts to sprawl westward, with acres of luxury apartments on small lots and office buildings on

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big ones. The building itself was built in three chunks, 20,000 or 30,000 square feet at a time, and so efficiently planned that the final addition didn't require any plumbing. Sit down at a picnic table out back and you might find yourself chatting with a programmer, a technical support specialist, a person who sends out brochures or handles complaints, an agent for the five-ship cruise line

or a new sales rep who's been fielding calls from around the world for one of Carlson's more than 400 Radisson Hotels & Resorts, 200-plus Country Inns & Suites and 13 Regent Hotels International.

"We're a small team that's stuck together for a long time, and we've benefited because a team gets to gel," says Heintzeman, whose Minneapolis digs keep him from getting dis-

tracted by the day-to-day operations of the center. "These principles are not birthed in a one-time meeting. They're birthed over months and years of working together."

While the four tell the story, it's almost as if they could finish each other's sentences but know they don't need to. An idea gets thrown on the table, then an explanation, maybe a problem, and Heintzeman picks up the essence of what's been said; puts it into order and articulates what it means for the business. "We all have grown up together," Heintzeman says. "Larger companies tend to have committees that work together or departments that work together, not people who just get together and make decisions."

Having almost everyone under one roof in Omaha pays off, too. Says Sikyta, "We're here every day, we have established trust with [the users], so they believe you when you say, 'This isn't going to work.' They don't believe you're just trying to get out of your job."

Ironically, the total outlay for the project by now has topped \$15 million, since the system includes capabilities not in the original plan. However, the new voice reservation system alone, unveiled in late 1999, looks as if it will translate into \$40 million a year in additional revenues from improved productivity because the agents can book more rooms more quickly. And in retrospect, the team isn't sure that getting one big check up front would have been the best answer.

"If there's a failure, it was the first time going in [to the board of directors] without a chunked model and trying to get it as one whole thing," Heintzeman says. "Two things really happened. The funding people were scared to death, and the IT people said, 'You know what, this is like the dog that caught the bus. What if I really did catch it, what would I do with it? Could we create a system that worked when we threw the switch?'" **CIO**

Staff Writer Sarah Scalet would happily take \$15 million either all at once or in chunks. How do you prefer to get funding for projects? E-mail sscalet@cio.com.

Platform Diving, Revisited

Carlson isn't quick to jump off client/server

WHEN CARLSON Hospitality Worldwide designed its new reservation system, client/server applications were all the rage (see "Platform Diving," CIO, March 15, 1997). Now Carlson has a three-tier client/server system—but today most people are jumping into a different pool: the browser-based thin-client computing model, which claims lower costs and simpler version management. However, executives at Carlson are sticking to their guns, saying they made the right architectural decision.

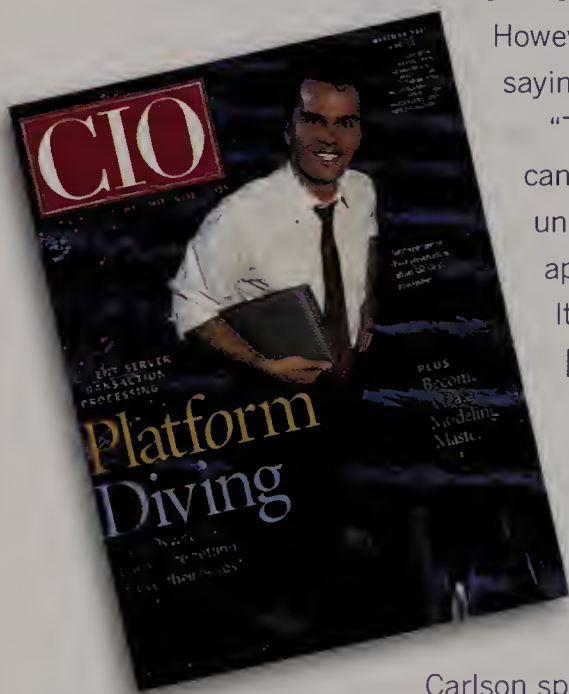
"The biggest advantage of the browser that I see is you can build software for a universe of users that is unknown," says Steve Medina, Carlson's director of application development. "We know who the users are. It's not like we allow anyone to come on and set [hotel] rates." Carlson emphasized making updates easy to deploy, trading download and update times for smoother operation, such as instantaneous responses on their agents' screens. "I think we have mitigated most of the downside by investing in the ability to deploy applications easily with low overhead," says Medina, who doesn't think

Carlson spends any more time maintaining PCs than it would if the company were using browsers.

Carlson Hotels Worldwide CIO Scott Heintzeman says the real debate should be about whether a system's logic is separate from its user interface and its data. "Once you have that very pristine separation, then you have the ability to make a thin-client or fat-client application down the road."

Carlson already has used a browser model where necessary: with the public website and at several locations in India where a third party makes reservations through a Web client that is based on the public website. "I don't think we've limited ourselves," says Tom Sikyta, senior director of distribution systems. "We can always move to a browser-based system."

—S.D. Scalet



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An illustration of a large, brown, rectangular building, resembling a giant toppling block or a stylized structure, falling from the sky. The building is tilted at a steep angle. Several people in white clothing are shown interacting with the structure: one person is climbing a rope on the upper left, another is at the bottom left pushing or supporting it, and a third is on the right side. The background is dark with a crescent moon in the upper left and some green, hilly terrain at the bottom. The title 'SHAKING THE FOUN' is overlaid in large, bold, yellow and orange letters.

SHAKING THE FOUN

Better start putting some Internet blocks into your brick-and-mortar foundation. Some companies have already begun the heavy lifting.

BY MERIDITH LEVINSON

Though Internet startups garner frenzied attention, it's those bellwether brick-and-mortar companies that everyone should be watching. They are the ones whose founda-

first in the Internet space, they don't have the opportunity to create new sources of revenue and value for themselves. Where does your company stand? In this section, *CIO* analyzes

how a few of the nimbler, more experimental blue chips have begun to address the challenges—and opportunities—posed by the Internet and the new economy.

After you read what they're

doing, you won't have any more excuses for not acting.

tions have been shaken by online business models and advances in technology. Ultimately, they have the most to lose—and gain—from the new economy. In spite of this, blue chips have been slow to do anything about the Internet. Who can blame them—it's risky business. Or is it? What's more threatening to the survival of these traditional companies is the attitude that it's safer to observe what shakes out from the sidelines. Equally risky is the assumption that, because these companies weren't the

DATION

SPECIAL REPORT AT A GLANCE

SCENARIO PLANNING

Align business units against Internet competition • Compare yourself with dotcom competitors 90

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Seven high-profile execs vs. Internet aggregators • The competitive forces shaping their industries 100

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ILLUSTRATION BY CHRIS VAN ES

To kick its e-business initiatives into high gear, GE told its unit chiefs to save their businesses by figuring out how to kill them

BY MERIDITH LEVINSON

DESTRUCTIVE Behavior

Some executives like to conceive their company's future through strategic-planning exercises. Not Jack Welch. For him, strategic planning is too safe, too theoretical. Instead, Welch had his business units envision how the future could hurt them. He called the exercise Destroy Your Business (DYB).

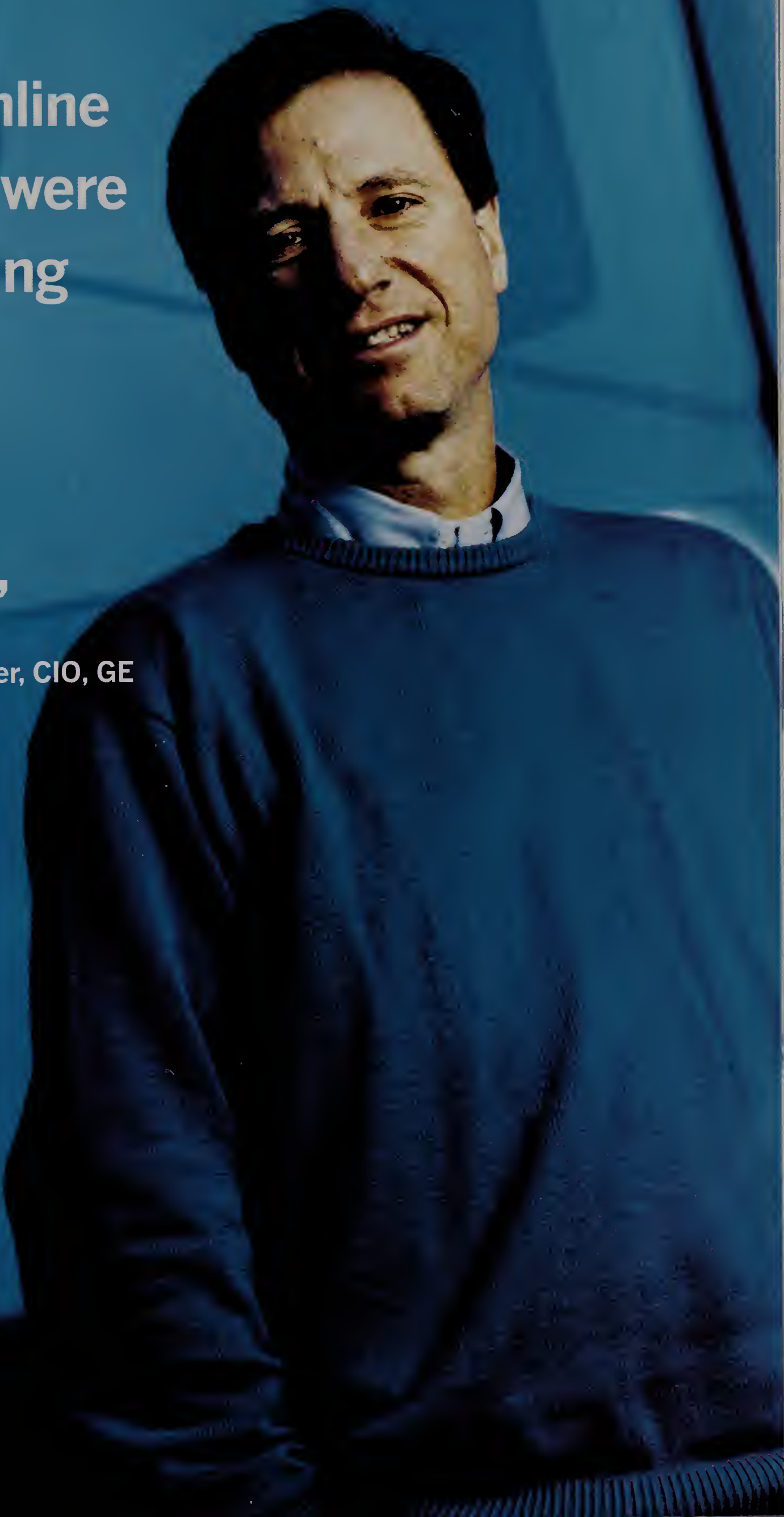
The DYB moniker captures the urgency that spread like atomic fallout throughout the Fairfield, Conn.-based company after Welch mandated that General Electric transform itself into an e-business in January 1999. This was no small feat for a technology, services and manufacturing company with a 122-year-old brick-and-mortar legacy and more than three dozen businesses spread across 100 countries. Welch

knew that hundreds of guerrilla companies (mostly dotcoms) were in the process of trying to destroy GE's business models, and if his company didn't identify its weaknesses then someone else would.

To quantify the vulnerabilities, DYB was instituted in every GE business unit. Each unit assembled a cross-functional team that benchmarked competitors and examined how their businesses operate, the products and services they offered, and the economics of ordering through the Web versus ordering through the sales force and call centers. The teams' goal was to present GE's top executives with a hypothetical Internet-based business plan that a competitor could use to erode GE's customer

**“We thought online
marketplaces were
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special and
mysterious....
Now we’re
a lot smarter.”**

—Gary Reiner, CIO, GE



base. In addition, the teams proposed how they would change their existing business model in response to these threats. This latter part of the exercise came to be known as GYB—Grow Your Business—because its objective was to find fresh ways to reach new customers and better serve existing ones.

The exercise came not a second too late for some of GE's business units. GE executives in the plastics and medical systems businesses, for instance, were concerned that they would be forced to join the rapidly proliferating B2B exchanges where their products and services would be commoditized. But the exercise resulted in retooled websites, new deals with suppliers and partners, new markets and better service. "When we have an initiative around here, it becomes an all-consuming thing," says Gary Reiner, GE's 45-year-old senior vice president and CIO.

Reiner served as the sounding board for all of GE's e-commerce leaders during the DYB process, bringing them together to share best practices. "We viewed e-commerce with a lot of trepidation," he says. "We thought [online marketplaces] were doing something special and mysterious—that they were going to take our customers away or redirect them to somebody else. Now we're a lot smarter."

Your company may not have the resources to turn on a dime the way GE did. But even if you can't change now, you can at least get a sense of what you're in for by doing your own version of DYB. Chances are, if a company is crazy and ambitious enough to figure out how it can destroy GE's \$122 billion business, there are probably 10 others that are scheming against your company. Read on to learn about the best practices that emerged from DYB/GYB in three of GE's businesses: plastics, appliances and medical systems.

IT BENDS, BUT IT DOESN'T BREAK: GE Plastics

"We have a rule here: Don't put something on the Internet unless it has a value proposition that is better than over the phone," ad-

vises Gerry Podesta, general manager of e-commerce for GE Plastics in Pittsfield, Mass.

He should know. GE Plastics' product catalog has been on the Web since 1995, and the company has been conducting transactions on GEPlastics.com since 1997. Podesta understands how difficult it is to ensure that a customer can find what he's looking for on the website faster than he could get the same information over the phone. In 1999, GEPlastics.com's strong sales of \$2 million to \$3 million a week were partly a result of using the phone test to vet online business processes.

Considering those sales figures, it would be safe to assume that GE Plastics, which manufactures the raw plastics used in products like cell phones and auto parts, wouldn't have much to learn when it started the DYB exercise in June 1999. But it did. Aggregators like PlasticsNet.com, which began transacting business on its site that year, were springing up all over the place. Revenue wasn't the issue here—of course GE had the edge. This would, however, be a duel of business models. Rather than stand pat, GE Plastics realized it would need to relaunch its website with more features and enhanced functionality to compete with some of the more innovative models out there.

The business that could destroy them would have a product catalog, discussion forums and a strong transaction capability on its website. Though GEPlastics.com's commerce capabilities offered a competitive advantage over PlasticsNet, the GE site lacked a community feel—something that PlasticsNet had been building since 1995 and that a lot of the Internet startups were trying to do by adding features such as chat rooms and Yellow Page directories to their sites. "There was no emerging site that was driving the majority of eyeballs in the industry," says Podesta, "but we felt that if we didn't step up in that area of community, someone else might preempt our position with our customers."

By looking only at websites in his own industry, Podesta knew he would not be able to create something that would blow away

the competition. So DYB team members began surfing consumer sites for inspiration, particularly auto manufacturers' sites, where visitors could use configuration tools to customize their cars.

Podesta and his team thought that they could bring customization to their customers (primarily product design engineers) by giving them advice on how plastics could best be used. Enhancing its site with smart technology would allow these engineers to design their products with GE's materials while reaching a much wider audience than the field sales force ever could on foot.

To develop the technology that would let engineers test different materials, GE Plastics put together a design engineering team (separate from the DYB team) consisting of individuals from IT, engineering and R&D. The group spent four months, beginning in October 1999, researching the services GE Plastics provided its customers and sifting through 30 years' worth of information on the properties of the materials it manufactures. From these studies, the team built the engineering design center of GEPlastics.com, which launched in February 2000.

Much of the technology on the site comes from the PC applications that sales people showed off when visiting customers. The most popular of these, the data sheet, helps product engineers determine a material's properties—like tensile strength, modulus and melting point. Having the PC applications drastically reduced the development time for the Web tools, but it wasn't a slam dunk. The IT challenge in getting them online, says Podesta, was first Web-enabling the PC formats and then creating databases of material properties to power the online features.

The new tools let product engineers get a sense of which materials they should use and how much they will cost. For example, a product engineer at a cell phone manufacturer plugs the dimensions of his product into GE Plastics' system and selects four different materials he's interested in using. GE's system then helps him determine how many molds he has to build to make

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a part. "When he's done in a few hours," says Podesta, "he has a fairly extensive matrix of what products would work and a ballpark figure on costs. It gives him an enormous head start on the process of designing the product."

For three decades, GE Plastics engineers had been helping customers select the right materials for their products, in spite of the fact that GE Plastics' primary business is manufacturing, not services. "In the end, we're doing design assistance," says Podesta. "It's a value-added service; it's not a part of the key sale. For us to be able to touch thousands of customers online rather than hundreds of customers [with the field sales force] is a big win for us."

Service might not be its primary business, but all of GE—not just plastics—is realizing that in order to increase customer loyalty, value-added services are an increasingly important way for the company to differentiate itself from competitors, and perhaps

the only way it can stay ahead in commodity businesses like plastics.

NUKING THE SUPPLY CHAIN: GE Appliances

"What would our business model look like if we were to go around the partners between us and the end consumer?" asks Joe DeAngelo, vice president of e-business for GE Appliances, explaining his business unit's No. 1 concern during the DYB/GYB process.

For the \$5.6 billion business in Louisville, Ky., the big DYB issue wasn't whether aggregators would hurt appliance retailers, it was whether its primary competitors—Maytag, Whirlpool and Frigidaire—would cut retailers out of the picture entirely. Before the Internet, these four manufacturers, which each own 25 percent of the appliance market, had only one way to bring their products to market: through large retailers like Home Depot and small mom-and-pop appliance stores. The Internet threatened to fragment that traditional model and make GE appliances commodities on big retail and auction sites. As part of the DYB exercise, GE Appliances had to ask itself how it could use the new Internet channel to maintain consumers' awareness of the GE brand without alienating GE's retail partners or cannibalizing existing channels.

GE spent years during the early part of the '90s perfecting its logistics system through a rigorous quality initiative known as Six Sigma. Implemented companywide, Six Sigma was an attempt to eliminate inefficiencies in GE's processes. DeAngelo led the Six Sigma initiative before becoming the vice president of e-biz for GE Appliances—his team focused on ways to leverage GE Appliances' edge in logistics during the DYB exercise. "We know that [order fulfillment and delivery is] an element of our business model that the other guys don't have, and we're going to build off that," he says. "We

GE Appliances VP of E-Business

JOE DEANGELO: "Should we sell direct to customers?"

are able to take products from our factories and get them shipped anywhere in the United States virtually overnight on a cost-effective basis," DeAngelo adds.

But as good as the system is, Reiner thinks Web customers will expect better, given the instant gratification of software downloads and book purchases that consumers get on the Web. "We're sensing that customer expectations are higher when they order over the Web than when they order over the phone," says CIO Reiner. "We are using Six Sigma in every one of our businesses to improve the fulfillment capability."

DeAngelo started DYB by looking at whether GE Appliances could deliver appliances directly into consumers' hands, using the company's most valuable asset—the



PHOTO BY JOE HARRISON



MEET THE WIZARD

As part of the company's effort to improve the way it serves customers—and prevent its merchandise from being completely commoditized—GE has developed wizards, applications that give customers answers to their questions about GE products over the Web. GE uses its wizards to dazzle all of its customers, from amateur chefs who want to know the best way to roast a chicken in an Advantium oven to medical technicians who hunger to improve the efficiency of their MRI equipment.

GE Medical Systems is using wizards to boost the productivity of its customers and make money. Joe Eckroth, CIO of the Waukesha, Wis.-based business, explains that in an effort to cut their costs, hospitals are insourcing the support and management of equipment that they had previously outsourced to GE. Though

they're doing the maintenance internally, the medical technicians still need advice on how to maintain their machines. To address this need, GE developed a self-service system for its website where a technician can find answers to her questions, such as how she can improve the output of her MRI. All she has to do is indicate the results she's currently getting, then the wizard guides her through ways she can improve the performance. It also shows the technician the results from other hospitals that use the same equipment.

"It's a better value proposition for the hospital and for us," says Eckroth. "They continue to get more productive, and we find a way for them to continue to need us. As they buy this intellect over the Web, we continue to have a revenue stream."

—M. Levinson

GE Medical Systems CIO JOE ECKROTH:

"The Internet wouldn't have destroyed our business, but the consolidation in health care would have."

retailers—as a sort of go-between. At the heart of the new system is a point-of-sale (POS) terminal that is installed at a Home Depot. When customers want to buy a GE fridge, they enter the order into the POS system, which is connected to GE's inventory and distribution systems. It allows consumers to buy appliances directly from GE through Home Depot and schedule an appointment to have the refrigerator delivered and installed at the customers' convenience. Home Depot gets a cut of the action and stays happy—really happy, according to DeAngelo.

"This gets retailers out of the game of carrying inventory on their floors," he says. "[Home Depot] was sucking up floor space with inventory, and we were able to free up

that space. What we basically did was interconnect and take [the excess inventory] out of the traditional retail model to make it a better shopping experience for the consumer and a better process experience for the retailer." By helping them reduce the amount of inventory they carry in their stores and warehouses, GE Appliances helps its retailers cut their costs.

"It's a format that we can use everywhere," notes DeAngelo. Indeed, GE uses essentially the same system for its virtual stores on NBC's portal Snap.com and NBCi's Xoom.com. "We've been in the process of selling appliances over our corporate intranet to GE employees for several months. That enabled us to create store capabilities that we can utilize anywhere," he says.

X-RAY VISION:

GE Medical Systems

"Individually, they were just popcorn stands," says GE Medical Systems CIO Joe Eckroth, referring to online information aggregators—such as Neoforma, MediBuy, WebMD and Healtheon—that hit his radar screen when his business embarked on DYB in early 1999.

Eckroth could afford to be flippant at the time. GE Medical Systems, the \$6.2 billion Waukesha, Wis.-based manufacturer of MRI, CT scan, ultrasound and mammography equipment, was leading its industry and was selling, as it always had, directly to doctors and medical technicians.

But then the popcorn stands started popping—they grew quickly, had frighteningly

large market caps and the money to do just about anything they wanted. "What got scary was when they started making partnerships and when WebMD and Healtheon actually merged together," Eckroth says.

Suddenly, Medical Systems became lost inside a cloud of undifferentiated medical equipment providers. Sites such as WebMD were aggregating unbiased information about all companies like GE Medical Systems, including its traditional OEM competitors Toshiba and Siemens, together on a single website. The sites reached both current GE customers and untapped prospects. To these buyers, GE looked like just another vendor.

A troubling scenario, to say the least. But if GE Medical Systems could offer the same level of service on the Web that its salespeople provided in person, and could transfer its system for fulfilling orders to the Internet, the equipment manufacturer could ensure its leadership position by offering another way to serve customers and attract new ones.

For instance, the aggregators auctioned used medical equipment on their sites. If Neoforma could do it, the DYB team surmised, GE Medical Systems could do it better because of its logistics capability. The Web auctions would also allow GE Medical Systems to reach formerly untapped markets: smaller domestic clinics and hospitals in Third World countries that don't have the money to spend on state-of-the-art stuff. "E-commerce opened up a whole new way for us to touch our customers, while the sales guys are still out there continuing to grow their marketplace."

Along the way, Eckroth and his team developed unique services specifically for the Internet. One such service allows medical technicians to download and test software for upgrading their MRIs off GEMedical-Systems.com. If they like it after the 30-day trial period, they can buy it. GE Medical Systems can now also monitor the productivity of its customers' equipment in real-time

via the Web; so if a machine goes down, GE Medical Systems' specialists are aware of the problem and can immediately work to bring it back up. On top of the real-time monitoring, GE Medical Systems also posts diagnostic information such as the run rate and throughput of a machine online, which customers can access every morning through their personalized webpages, to find out whether their

GE'S BEST PRACTICES

FOCUS Your e-business applications should focus on how your customers can grow their business, streamline processes or reduce costs.

SPEED MATTERS Make sure what you're offering customers via the Web, whether they're B2B or B2C, is faster, cheaper and better than any other delivery mechanism.

VALUE New Internet services should enhance value for existing customers rather than simply reaching new ones.

—M. Levinson

machines are running at capacity. "We offer a full range of solutions that go beyond online transactions," says Eckroth. "These are all big productivity adds for the hospital."

Web-enabling services that enhance the productivity of customers is key to all GYB strategies. Take Tip TV, Medical Systems' satellite television network that broadcasts programs to teach doctors and clinicians how to use GE equipment to perform medical procedures. Eckroth's crew made the network accessible from any browser.

Before it went on the Web, doctors and clinicians had to sign up to attend a Tip TV class six weeks prior to ensure a spot. After the class, they would have to wait another several weeks before they received the results of their exams.

Tip TV went online at the end of December 1999. Doctors can now sign up for Web-based classes online anytime, take tests in real-time, get their results immediately and manage their credits—doctors and clinicians

take 24 credits' worth of classes every two years to stay current on GE equipment. Medical Systems expanded the content by partnering with Internet startup Health-Dream, in which it took equity stake, and with *New England Journal of Medicine*, which provides educational material.

"The Internet really wouldn't have destroyed our business, but the economics and the consolidation in health care would have," says Eckroth. "The Web helps us find a brand-new avenue to keep our business alive and to continue to make money out of it."

DYB MEANS DO IT YOURSELF, Only Better

Through DYB, GE's business units confronted risks and threats head on, transforming them into opportunities to open new markets, reach more customers, enhance services and develop technologies that could be applied across all businesses.

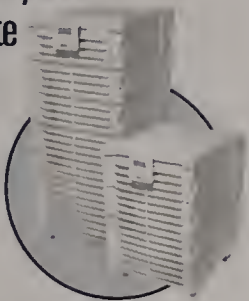
Rather than striking fear throughout the company, DYB helped give GE's old-line businesses new confidence that they can survive and thrive in the face of the Internet onslaught. "What we have since found is that aggregators in most of the businesses in which we play are not going to survive," says Reiner. The reason is that most industries have only a few big suppliers. If one of the big players doesn't play, the aggregator will lose credibility fast. When the aggregator doesn't aggregate everyone, it doesn't add much value.

The Internet hasn't changed the basic wants of customers, argues Reiner. "We concluded that the biggest thing customers wanted was fulfillment and brand. An aggregator can provide neither of those. Plastics-Net is a website. They've got nothing else but that." **CIO**

CIO Staff Writer Meridith Levinson was impressed by DYB. Were you? E-mail her at mlevinson@cio.com.

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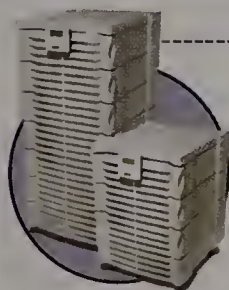
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Online startups are stealing the established players' business. Seven executives share their survival strategies.

BY MERIDITH LEVINSON

BRICK Slayers

On the Internet, archcompetitors have become strategic partners. Suppliers, perennial outsiders, are now invited—even commanded—to come inside the company and learn its deepest secrets. Planning and executing have merged into a single “launch and learn” continuum. Even uncontrolled financial bleeding no longer indicates a company’s imminent demise, as Amazon.com has proved, a company whose market cap is in the tens of billions (at last count, \$15.7 billion) but whose balance sheet shows a net loss.

Internet startups like Amazon.com are insinuating themselves into such well-established industries as bookselling. But that practice alone doesn’t account for the Internet’s real threat, which involves more than simply a new way of selling things. Amazon.com’s B2B cousins—the intermediaries and aggregators—are the ones that are cannibalizing traditional industries, robbing them of their valuable processes of manufacturing and supplying goods and services to customers. Here, on the homepages of companies like CheMatch.com (which mediates sales between chemical manufacturers and buyers)

THE STRATEGISTS

MELANIE ALSHAB, former CIO, Simon Property Group and former president and founder, Clixnmortar

PHILIP ANDERSON, associate professor of business administration, Tuck School of Business, Dartmouth College

EVAN GROSSMAN, senior vice president, Hookmedia

ALAN HUGHES, executive vice president and CIO, Deutsche Financial Services

JAMES MCGEE, founding partner, Diamond Technology Partners

JEFFREY PETERSON, vice president of e-business, E.I. du Pont de Nemours

ELIZABETH ROSE, vice president of strategic planning and e-commerce, BMG Direct

RALPH SZYGENDA, group vice president of Information Systems and Services and CIO, General Motors





GM's Ralph Szygenda: "We knew the barbarians would try to take over pieces of our business."

or Quicken.com (which offers the financial services traditionally supplied by banks and brokerage houses) is where the real threat of the Internet lies for Fortune 500 executives. In an environment with no clear paths nor absolutes, business leaders must single out the competitive forces of Internet startups and intermediaries that are encroaching on their businesses and find ways to attenuate the risks. To help



Deutsche Financial Services' Alan Hughes: "It's questionable in my mind what value these portals are adding other than the perception of choice."

them, *CIO* asked seven high-powered executives to share their insights on surviving in the new economy. During this roundtable, they voiced their predictions about the tumultuous Internet business world over the next two years.

CIO: Startup online intermediaries such as Autobytel.com that insert themselves into value chains, insisting they bring more value to end customers, have already entered most industries. What effect are they having on your business and your industry, and how do you know whether they're friend or foe?

Ralph Szygenda: We assumed barbarians were coming in 1996 and 1997. We didn't know who the barbarians were at the time, but we knew somebody was trying to take away pieces of our business or pieces of how we run our business and how we interact with our customers. We identified each of the competitive forces (only one was in the automotive industry) and strategized about whether to form alliances or to compete with these portals, infrastructure companies or Net buying services. Examining potential

PHOTO LEFT BY GEORGE WALDMAN PHOTO RIGHT BY STEVE ESCHNER



Diamond Technology Partners' James McGee: "We like to start by getting a clear picture of the end customer's viewpoint."

DuPont's Jeffrey Peterson:

"Exchange and auction markets are taking advantage of inefficiencies in the value chain today."

alliances or equity partners in the automotive industry or across industries is now a major issue for the senior management committee at General Motors.

Alan Hughes: We're starting to see aggregation sites from outside the financial-services industry enter our industry and become middlemen between financial-services providers [us] and their customers. The aggregators are spending huge amounts of money to [gain and] maintain their footholds.

It's questionable in my mind what value these portals are adding other than the percep-

tion of choice. Joining them puts us in a commodity position where we're differentiated based on the price of our money versus the price of, let's say, Transamerica's. One of our strategies for mitigating the effect of portals is to understand the choices that customers think they're getting from those portals that perhaps we're not providing, and to add those enhancements to our site. We do feel that it is incumbent upon us to rethink our product delivery and to determine whether we're providing enough choice.

James McGee: We like to start

by getting a clear picture of the end customer's viewpoint and then working in from what the customer wants as opposed to working out from our assumptions about a particular industry or the way we've always done things.

Jeffrey Peterson: Exchange and auction markets are taking advantage of inefficiencies in the value chain today. They offer very specific, vertical-market solutions to facilitate very efficient transactions. In the process, they're unbundling the physical product from the services and knowledge that has typically surrounded it.

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J	S	H	O	V	C	E	N	Q	W	L	U	L	I	X	E	O
S	N	R	L	A	E	M	J	G	E	K	P	P	G	C	F	E
E	P	V	C	H	F	U	L	L	S	P	E	E	D	V	D	R

1. AMD (see example)
2. Athlon
3. processor
4. now
5. with
6. full-speed
7. performance
8. enhancing
9. cache
10. memory

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We've spent a lot of time trying to understand how they [exchange and auction sites] unbundle our products and the value proposition that they offer customers. Then we choose either to partner with an exchange that may have a dominant stake in a particular area or to partner with an external company that would actually create a space for us. In some cases, you'll befriend a particular set of companies. That same set of companies may be a foe in a different vertical [market] or segment area. It's pretty tough for

small dotcoms to compete against the resources of a large company like us once we understand what they're providing the customer that we aren't.

Evan Grossman: I'd like some good examples of big companies that have successfully outrun a dotcom. I assure you, in 1995, Barnes & Noble was looking at Amazon.com and saying, "Great. Once we figure out how to sell books on the Web, we'll just take over. We're so much bigger. We have so much more money and better

management that it will be an easy win." Probably some auctioneers thought the same thing about eBay. What do BMG and others think about CD Now?

Elizabeth Rose: One of the biggest issues facing CD Now is that it must turn a profit [to survive]. Its operating margins can't support the marketing it needs to continue building its brand. Somewhere along the line, these dotcoms will have to incorporate a number of traditional business disciplines.

Hookmedia's Evan Grossman:

"I'd like some good examples of big companies that have successfully outrun a dotcom."



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BMG Direct's Elizabeth Rose:

"These Internet companies need to hire people with operational skills and discipline, or they'll be overtaken."

The executive mentality of, "We're going to create a brand regardless of profits," requires different executive skills from [the mentality], "We're going to operate this business for profit." These [Internet] companies need to develop or hire people with operational skills and discipline, or they'll be overtaken by an existing company that already has those skills and has learned



Dartmouth College's Philip Anderson: "Every unfair advantage you have counts."

the Internet side. Wal-Mart.com comes to mind as having real potential to blow out a number of dotcom competitors because if anybody knows how to make money on narrow margins, it's Wal-Mart.

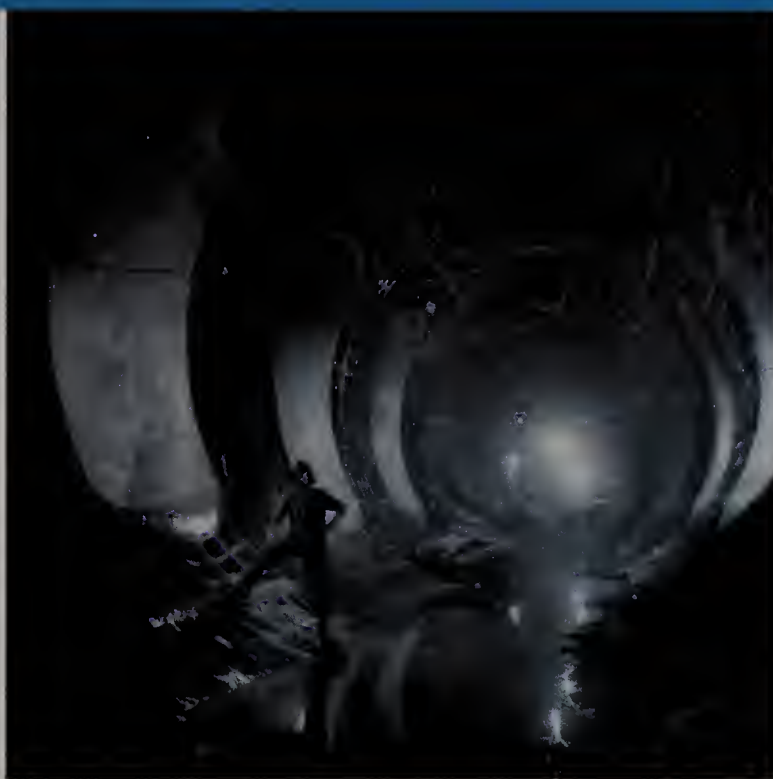
Philip Anderson: SportsLine attempted to beat ESPN out of the sports business with no success. Similarly, the site that received the most traffic for the March Madness brackets happened to be NBA.com and not the million college basketball startups that have come along.

Grossman: [ESPN and NBA.com] were out there early and didn't wait to play catch-up. I don't know whether these established companies actually [needed to overtake new entries] the way that Barnes & Noble thought it could overtake Amazon.com.

Hughes: It's not yet clear that Barnes & Noble hasn't overtaken Amazon.com, [that is] if Amazon.com were held to the same earnings expectations as Barnes & Noble is held to in the capital markets. Some of

dreams made real.

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these companies are being given this forgiveness that obviously won't last forever.

Melanie Alshab: As the capital markets try to value different business models, it's fair to say that it will be a much more complicated task than it used to be, particularly if these brick-and-mortar businesses integrate old-line businesses with new-line Web businesses. The capital markets are just

now beginning to deal with that. The point is, we're at the beginning, and to say that anybody has won or lost is premature. But you have to play the game to win.

Peterson: I'm not sure it is a win or lose situation. I think it's a consolidation game that's going to come up within the next 12 to 24 months.

Anderson: Another example of

a company that has fended off dotcom competition is Ticketmaster.

Rose: They have a monopoly on the venues to which they sell tickets.

Anderson: Every unfair advantage you have counts. **CIO**

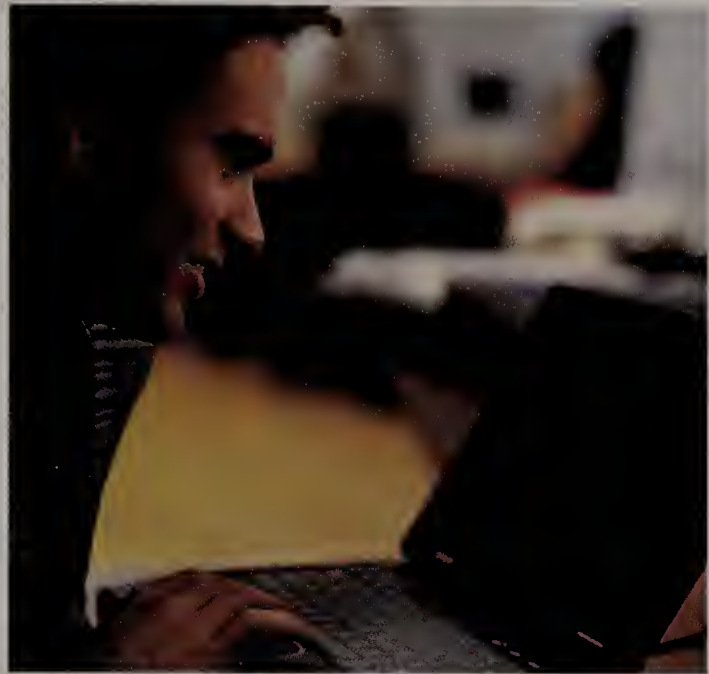
Are you worried about your company's survival? Tell Staff Writer Meridith Levinson at mlevinson@cio.com.

Melanie Alshab:

"The capital markets are just beginning to deal with the integration of bricks and clicks."



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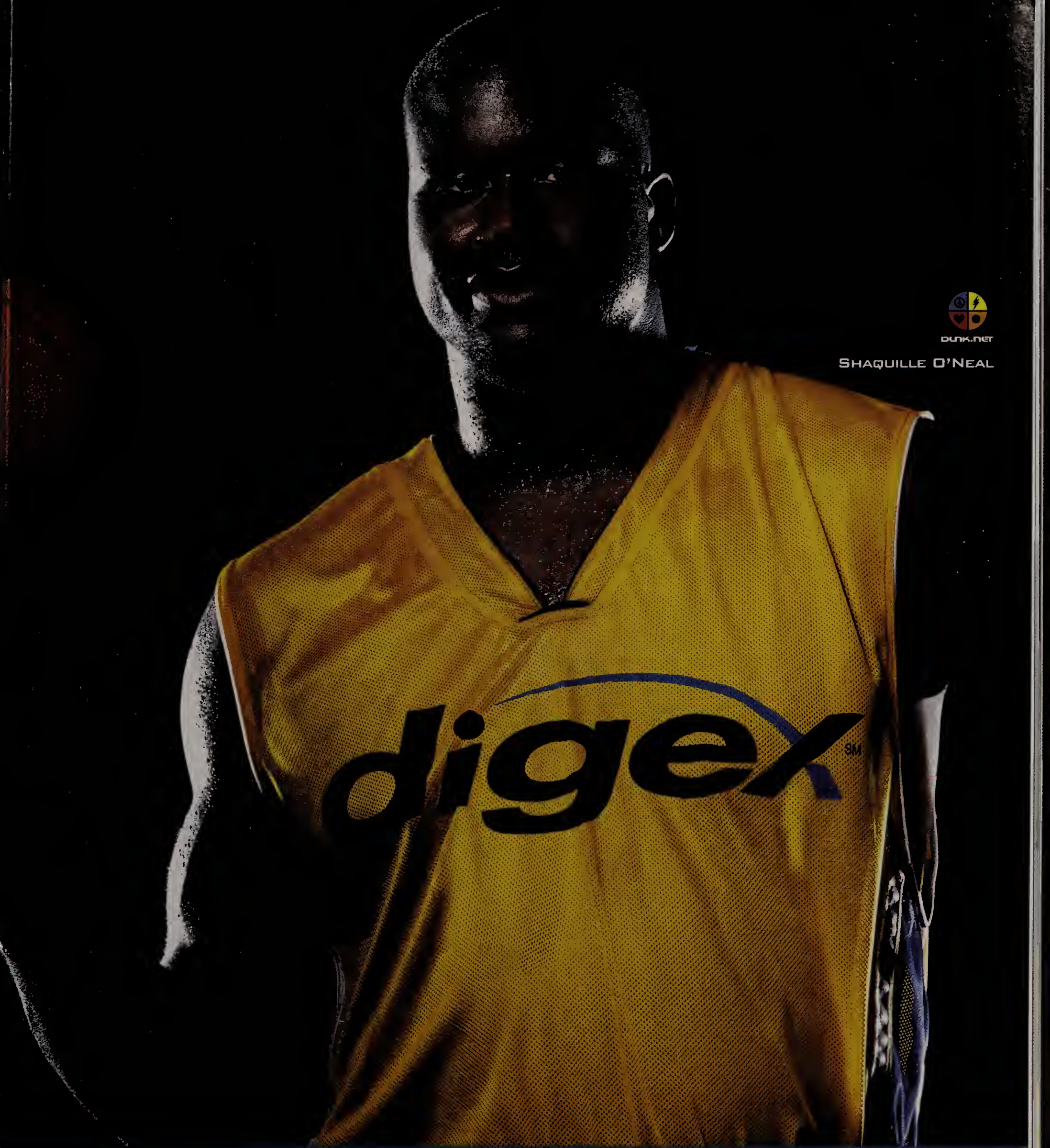


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A mall developer equips retailers with ways to merge their online and brick-and-mortar channels

BY MERIDITH LEVINSON

Simon says: INTEGRATE YOUR CHANNELS

When Melanie Alshab introduced herself as “the CIO of a very large landlord” to other attendees at Internet conferences back in 1997, they brushed her off like pills on a Patagonia vest. No one from the dotcom world wanted to talk to the former Simon Property Group executive because she was from the world of brick and mortar—shopping mall brick and mortar. With online shopping taking off, who needed her company’s physical retail spaces anymore, anyway? Similarly, when Alshab networked at real estate conferences, her colleagues there dismissed her Internet boosterism as hot air

about a passing fad. Based on what she heard at these events and from consumers, Alshab and her peers at the Indianapolis-based real estate developer couldn’t imagine either channel ultimately winning out. “We believed that the physical channels would be around for the long haul as much as the Internet would be,” says Alshab.

She also knew that consumers didn’t understand why they couldn’t return something to a store if they bought it off the website. “For consumers, the need [to integrate the channels] was already there,” she says. If retailers were going to respond to this need

Simon had to provide much more support than the infrastructures that companies like The Gap already provided their stores: sophisticated computer networks packed with integrated customer relationship management, distribution, logistics and inventory systems.

Mixing Bricks and Clicks

After searching in vain for a company that could provide all of these services, the developer decided in 1998 that it would offer them itself through a new subsidiary called Clixnmortar that incubates, develops and launches innovative services that combine physical and online retailing. Simon CEO David Simon named Alshab company president while she juggled her responsibilities as CIO (at press time, Alshab had left Clixnmortar for consulting).

Currently, Clixnmortar offers three services. The first, MerchantWired, installs

Wired was beta tested in seven malls in 1999 and officially launched in May 2000.

The other two services, Fast Frog (www.fastfrog.com) for teens and Your Sherpa (www.yoursherpa.com)—named for Tibetans who live in the Himalayas and provide support to mountain climbers—for affluent, time-starved adults, facilitate the online and real-world shopping and buying experiences. (The services are being piloted in three malls in the Atlanta area.)

Both services essentially work the same way. Shoppers first register with Fast Frog or Your Sherpa at a designated location in a Simon mall, like the valet parking area. There, they are given a personal webpage that they access with a user name and password through either the Fast Frog or Your Sherpa websites. They also pick up a handheld computer to scan merchandise that catches their eyes in stores. After scanning something, they are prompted to answer a

retailers pay Clixnmortar a participation fee and a cut of each transaction.

Alshab sees several ways that these services can pay off. First, the company is developing expertise in setting up the logistics and infrastructure to help stores conduct sales across different channels. Second, it's developing partnerships with technology companies.

Know Your Demand

But that's just the beginning, according to Alshab. "Around Fast Frog and Your Sherpa, there are opportunities that we haven't leveraged yet," she says. One is to let retailers advertise on the PDA, so if customers walk by a Starbucks in the mall they'll receive a message alerting them that they can pick up a latte without having to linger.

Another opportunity surrounds the aggregated information on the products that capture the fleeting fancies of fickle teens. Alshab says that most teens don't buy much when they go shopping, and what they do buy usually sits on a waiting list for a few weeks before money changes hands. So if Abercrombie and Fitch has stocked both denim and suede jackets on its racks and is about to produce another million of each, and if, according to Fast Frog numbers, kids are snubbing the suede, Abercrombie might decide to increase the production of the denim to 2 million and deep-six the suede.

But what if the number of kids subscribing to Fast Frog isn't enough to represent an accurate sampling of buyers? Will Abercrombie be safe adjusting their production cycles?

Shannon Haslund, Clixnmortar's vice president of operations, doesn't think it's an issue. She views the information the company provides to retailers as a value-added service on top of the functionality retailers get through Fast Frog or Your Sherpa. "Retailers are already spending money studying trends between stores and trying to aggregate this information," she says. **CIO**

What are you going to do about your company's survival? E-mail Staff Writer Meridith Levinson at mlevinson@cio.com.

WHAT AMERICANS DO BEST: SHOP

44,367

Total U.S. shopping centers (1999)

190.5

Number of adults shopping in centers per month (in millions)

23%

of mall traffic is people under 25

5 hours

Teenagers and seniors spend the most time in malls per month

30 to 54

The age of women who spend the most money in malls

SOURCE: "NATIONAL BENCHMARKS OF SHOPPING PATTERNS AND TRENDS" STUDY BY THE INTERNATIONAL COUNCIL OF SHOPPING CENTERS

secure data networks, voice over IP and redundant WANs in retail stores. If Victoria's Secret wants to draw crowds with in-store cybercasts of fashion shows, or if a music store wants to let its customers burn their own CDs by downloading music from Web-enabled kiosks, Tenant Connect.net provides the requisite Internet connection. "These applications require some sort of IP-based infrastructure that needs to be redundant, highly reliable and burst to various levels of bandwidth," explains Alshab. Merchant-

question on the LCD, asking if they want to buy the product now or if they want to think about it. When they're done shopping and they return the device to the specified location in the mall, it gets synched up to their personal webpage, which lists everything that they scanned. Here they decide how they want to fulfill their orders—if they want to buy it at the mall or from the retailer's website. If they opt for the Web, they determine how and where they want it shipped and if they need it gift wrapped. Meanwhile,

MALL GAMES

Giving shoppers portable information tools will create fat new markets from thin air. Trouble is, no one's exactly sure how yet. Our roundtable panelists brainstorm what Clixnmortar can offer to enhance its mobile business model. The participants: **Melanie Alshab**, Clixnmortar; **Philip Anderson**, Dartmouth College; **Evan Grossman**, Hookmedia; **Alan Hughes**, Deutsche Financial Services; **James McGee**, Diamond Technology Partners; **Elizabeth Rose**, BMG Direct; **Ralph Szygenda**, General Motors. (For more information on the panelists, see Page 106.)

Philip Anderson: What can Clixnmortar do with a combination of offline plus online that makes the whole worth more than the sum of its parts?

Melanie Alshab: People browse in stores and then buy online. People browse online and then buy in stores. The reason why Clixnmortar is worth more is because that's the way that people engage with the two channels.

Anderson: Isn't it also a defensive maneuver?

Alshab: That's partially true, but if you look at the statistics, the mall business is very healthy. We looked at Clixnmortar as a way to learn what infrastructure requirements would be needed to support consumers as they engage with brands and retailers both online and offline.

James McGee: Customers don't necessarily make that online and offline distinction. Customers just want to get their Gap T-shirt; they're not interested in long explanations of why they can't return it to the store [if they bought it online].

Anderson: With the scanning

device, the customer is no longer tethered to a kiosk in the store. What can we do with this handheld device that moves beyond the value propositions that we've been talking about so far? Simplicity, seamlessness and convenience.

McGee: If you were to buy a particular piece of clothing from a store, folks in the store three doors down will offer you some other part of the outfit that goes with it but that doesn't compete with the store.

Elizabeth Rose: The reason mall usage statistics continue to improve is because going to the mall is not necessarily about shopping. It's about entertainment, hanging out and friendship. With this device, you might link different products and different stores together in some sort of entertainment product or experience. Maybe you're running around, zapping different items in a store, as if you're playing a game, like scavenger hunt.

McGee: Put instant messaging on it and you can find out that three of your best buddies are somewhere else in the mall. A

restaurant could display a message that says, "If all of you show up for lunch within the next 30 minutes, we'll give you 10 percent off."

Anderson: I'd like to take a snapshot of something and send it as an e-mail attachment to my wife and ask her, "I saw this at the mall. Do you want me to pick it up?"

Alan Hughes: If they're buying larger durables like a refrigerator, microwave or a barbecue, you could offer product insurance and financing options online. This device could be loaded up with the individual's credit line, and they could buy up to their credit line.

McGee: Ralph, what if I were sitting in a GM dealership with one of these wireless devices and decided that I wanted to buy a Suburban? I could start a bidding auction online to find the best financing and then tell the dealer, "Hey, I'm ready to buy, and I've got the financing in place."

Ralph Szygenda: We're moving to putting kiosks in dealerships so that the device would be very applicable there. We want to sell other products and services besides cars when customers are in a dealership.

Anderson: The revenue model of Clixnmortar looks like a participation fee, a transaction fee and possibly in the future advertising revenue and information aggregation for retailers. Can you think of other revenue models that might work, and do you see some pitfalls with the notion of a participation or transaction fee?

Evan Grossman: Something like this will work only on a broader scale. If it's available just at the Simon malls in your area, that's very much in Simon's interest. I'm not sure how much of that is in the consumer's interest or The Gap's interest. This creates an interesting cannibalization question. Do you open it up to other large mall developers? Do you open it up to other retailers? What we're talking about here is a new retail platform. To make it successful, you need a lot of people to participate. In my experience, most manufacturers are always dying for better purchase data that they never get from their retailers. This is another good source of that information.

Rose: I think Clixnmortar needs to move to a licensing model. It's going to be part of some other handheld device that people are carrying around, like a cell phone. The question that strikes me is, How many devices are consumers going to carry? The real potential is to integrate a bar-code reader into some device that we carry around with us all the time, whether it is our cell phone, Palm Pilot or some other device.

Anderson: It seems to me that the real opportunity here is for services that are mall specific rather than store specific. For example, cross promotions that refer to different stores in the mall or a loyalty program where you get points for whatever you do in the mall as opposed to what you do in a particular store.

—M. Levinson



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Window Seat

Website personalization software helps American Airlines give its customers a more tailored view of the airline

BY LOUISE FICKEL

The Company: American Airlines

Founded 1929 **Revenues** \$17.7 billion in 1999
Headquarters Fort Worth, Texas **Employees** 92,000
Customers 38 million AAdvantage (frequent flier) customers **URL** www.aa.com

FIVE YEARS AGO, American Airlines entered new territory by launching the industry's first website. In those early days of the Web, allowing customers to check logistical details such as baggage requirements, in-flight movie schedules and airport maps was big news. But the airline had even bigger plans: American hoped that opening up the online channel would not only streamline communication with customers but also cut costs of handling customer transactions and eventually generate additional revenue by allowing customers to book flights online. "At the time, paying commissions and booking fees to computerized systems [such as America Online and CompuServe] made it expensive to do business," says John Samuel, vice president of interactive marketing. "So saving distribution costs was a major driver."

Before launching its website, American knew a great deal about the 35 million frequent fliers who had joined its AAdvantage rewards program. And it had started to single out its highest-value customers for preferential treatment like free upgrades and higher mile bonuses. "What started out as a [frequent flier] program to encourage repeat purchases has grown into a tiered recognition program that identifies our best customers and gives them perks," says Samuel.

But even though American had a vast store of customer information, the airline wasn't able to put it to good use. "Our customers were already telling us a lot about themselves, and they were disappointed that we weren't serving them better," Samuel says. "As soon as you ask a customer what they want, you create an expectation of 'You now understand my needs, so I expect you to act accordingly.'" Acting accordingly, however, was easier said



John Samuel: *"Personalization has been harder and more demanding than we expected."*

than done in the pre-Web era, when American's main vehicle for communicating with AAdvantage members was its monthly mileage statement mailings. Although it used those statements to promote special deals to large segments of customers, "it wasn't as targeted as we would have liked," says Samuel. He adds that while the airline was already using its AAdvantage database to target offers for new routes (for example, customers who had flown to Europe on business would be notified of a new European destination), "we knew that we should structure that information more proactively." The Web offered the opportunity to more finely customize communications, service and offers in a cost-effective way—as well as the ability to conduct transactions.

American's early optimism about the Web's potential was well founded. Now ranked No. 2 (behind Southwest Airlines)

among airline sites by MediaMetrix, American's site has evolved from a repository of information into a true e-commerce site where customers can now book flights and find up-to-the-minute status reports on individual flights. (In fact, *www.aa.com* received a Web Business 50/50 award in the July 1, 2000, issue of *CIO*.) Each month, 5 million visitors use the site to review their AAdvantage accounts, check flight schedules and fares (for both American and competing airlines), make reservations, download electronic timetables and find answers to frequently-asked questions. Customers earn up to 1,000 miles for every flight booked on the site. So far, about 50 percent of AAdvantage top-tier (Platinum) customers and 60 percent of the approximately 11 million active AAdvantage members have visited the site. More than 2 million NetSAAver e-mails, which announce last minute specials, are mailed each week.

"When you *personalize*, you have to satisfy customers' needs for *relevant content*. It's easy to underdeliver on customers' high expectations."

—JOHN SAMUEL, VICE PRESIDENT OF INTERACTIVE MARKETING FOR AMERICAN AIRLINES

The site has also begun to generate revenue. In 1999, Web traffic yielded nearly \$500 million in booked revenues—airline parlance for reservations, which don't always result in actual sales. "We expect more than \$1 billion in revenues booked over the site this year," says Samuel. That figure translates into nearly 5 percent of American Airlines' total annual revenues.

Personalization in Practice

American is betting that personalization technology will play an important role in helping lure more visitors to its site—and turn them into more frequent fliers. The personalization process begins when a customer either calls American's toll-free number or visits the site and creates a profile of personal preferences, such as home airport, frequent destinations, and the names and AAdvantage numbers of companion travelers. Then, whenever that customer visits *www.aa.com*, personalization software from BroadVision and Epiphany lets American customize the page according to the customer's tier level (for example, Gold or Platinum) and location.

Here's how it works. Two databases provide the information needed to build the page—a customer profile database (which includes customer profile and preference information) and a content database. Based on the customer's profile and tier level, a set of business rules builds a page with content

targeted to the customer. So, for example, if you indicate that you usually fly out of Atlanta, your page might contain special deals being offered this weekend departing from Atlanta, as well as what Samuel refers to as a “stretch” message telling you that you are only X number of miles away from being upgraded from Gold to Platinum status.

Personalization software also lets American try out offers on small groups so it can roll out those with the most potential on a wider scale. Last year, the airline began quarterly tests to determine the success of various offers as well as which offers will be likely to appeal to specific customer segments. “We make an offer to two sets of customers and track how each group responds,” says Samuel. The groups range in size from several hundred to several thousand. “These tests have shown which offers are more attractive,” he explains. “They’ve allowed us to prove our approach. And that helps convince a company of this size that personalization is a good idea.”

From Personalization to CRM

So convinced were American executives that personalization is, in fact, a good idea, they launched a companywide CRM initiative in 1999. Led by American Airlines veteran Elizabeth Crandall, managing director of personalized marketing (who reports to Samuel), the customer relationship management effort will focus on the CRM structure for the website and other Internet tools. “We need an effective way of capturing customers’ needs and delivering on [them],” says Samuel. “So we must broaden our capabilities beyond the website and e-mail to include all other customer touch points.”

The focus of the CRM initiative is sharing customer information companywide. “We want to create success metrics so that people throughout the company go beyond the functional level to better understand the customer,” Samuel says. “We haven’t done a lot of reporting at the customer level in the past. We’ve tracked metrics, such as on-time performance, but not at the customer level. We want to know, for example, if we’re

starting to disappoint a Platinum-level customer with on-time performance.”

As part of the overall CRM effort, American is now working to integrate the customer profile database with the AAdvantage database across the company. Some data from the AAdvantage database is currently available across all customer touch points. The customer profile database, however, is only available via the Web. Once the two are integrated, the entire company will

have a 360-degree view of the customer. According to Samuel, by late summer the company expects to give its call center reservation agents a complete view of the customer. Getting all its ticket counter agents on board will take longer. “With more than 220 domestic airports as well as international airports, the logistics are a lot more difficult,” says Samuel. But he thinks it will be worth the effort; giving all agents access to complete customer information will

EXPERT ANALYSIS BY LYNNE HARVEY

Beyond Cheery Greetings

American Airlines understands that effective personalization really makes it easy for its customers to do business with the airline. Although at a glance it may seem that www.aa.com offers mass customization rather than individual personalization, American Airlines is in fact providing the right mix of information and services. For most customers, this means being able to assess which flight enables them to get to their destination at the best possible price in the shortest time possible—and to buy their tickets online. But even if a customer just uses the site to verify an arrival time before heading to the airport to pick someone up, www.aa.com can create a positive impression that may lead to future transactions and possibly even customer loyalty.

To be effective, personalization has to go far beyond providing a cheery greeting, a cross-selling suggestion and a bunch of frequent flier miles in a marketing program. Personalization must enable customer loyalty by providing highly individualized service. When applied to a tiered marketing loyalty program like AAdvantage, it should enable American Airlines to recognize its customers and provide a framework for structuring relevant information and offering rewards.

The challenge for American, as well as for most businesses, is to offer a consistent customer experience across channels. Loyal customers like Scherr should be able to access the same kinds of services from American through their cell phones and Palm Pilots that they can get through their computers. A potential minefield, however, that American needs to navigate, involves privacy and their use of each individual’s profile data. If American is providing a joint rewards program with America Online, the potential for violating customers’ privacy is huge. The two companies really need to communicate their privacy policy clearly with their customers and allow them to opt into, rather than opt out of, their personalized services and rewards programs. Overall, if American Airlines continues to apply personalization to deliver highly individualized service, it will continue to foster a loyal base of customers.



Lynne Harvey is a senior consultant and analyst specializing in CRM, customer intelligence and e-marketing strategies at the Patricia Seybold Group in Boston.

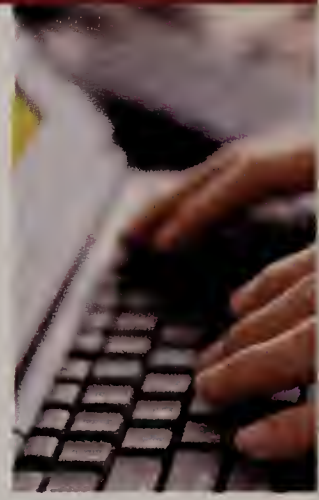


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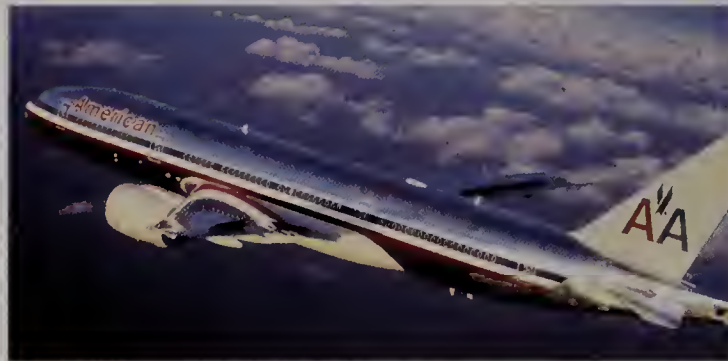
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allow American to increase efficiency, speeding the ticket-buying process at airports. Because the airline will understand more about the profitability of customers, it will also be able to provide premium services more effectively to higher tier customers. Finally, American will be better able to target customers for "stimulation" (sending a NetSAver e-mail that convinces a customer to book an extra trip because it's a bargain) and "sell up" (enticing a business customer to join the Admiral's Club, which gives them access to American's private airport lounges). "All three benefit the customer and us," says Samuel.

The Challenges of Personalizing

During the last five years Samuel's team has learned a few lessons. "Personalization has been harder and more demanding than we initially expected," says Samuel. "When you personalize, you have to create enough content to satisfy customers' needs for relevant content. It's easy to underdeliver when it comes to customers' high expectations. In the past, we asked our customers what types of trips they wanted to make and didn't always deliver." Samuel's group quickly recognized that people across the company would need to pitch in to develop sufficient content; other groups such as sales and advertising now contribute to the content database for the website as well.

And then there is the question of how to execute a strategy that identifies each customer and creates a unique experience for everyone. "Technically we have struggled with the infrastructure; from building pages dynamically to handling the volume of traffic," says Samuel. Although his staff initially considered developing a customized application in-house, they finally decided to invest in third-party software. Even so, there were technical details that had to be resolved.



CRM at American Airlines

Website objective: Build stronger relationships with AAdvantage customers, control distribution costs, generate revenue

Enabling technology: BroadVision's One-To-One and Epiphany's E.4 System draw from American's customer profile database and a content database to serve up customized pages to website visitors. Powered by Oracle, both databases are managed via USWeb at a data center in Sunnyvale, Calif. (The AAdvantage database, which tracks frequent flier data and is synchronized with the customer profile database via proprietary middleware, runs on an NCR Teradata database.)

Scope: Gradual expansion of personalization capabilities with the ultimate goal of integrating information across all customer touch-points companywide

Payoff: An expected \$1 billion in booked revenues this year and better communication with customers

"Customer identification sounds trivial," says Samuel. "We use the AAdvantage number and a PIN, and that works. But we, along with the customers, are anxious to find an alternative such as voice recognition or thumbprints that will be easier for both parties."

Managing growth has also been difficult. "It's a full-time job," says Samuel, who reports that his staff has swelled from six to about 50. In fact, all of the technical work, such as programming and help-desk support, is outsourced.

Samuel maintains that it's still early in the game when it comes to personalization at American Airlines. "We're still struggling and learning a lot," he says. "Just because we had an early start doesn't mean that we're experts."

Expanding Customers' Options

As American has discovered, being a Web pioneer doesn't earn a company the right to rest on its laurels. Once customers have had a taste of personalization, they come to expect it. And it takes more to impress them the next time. This growing demand for personalization has compelled the company to revamp its site every few months.

To boost customer loyalty via the Web, American announced in January that it will partner with America Online to create what it calls the world's largest online customer loyalty program. Combining the AOL Rewards Program and the American AAdvantage Program under one roof will let customers earn and redeem miles for products such as CDs and books, and services such as hotel accommodations and car rentals. "We wanted to broaden our customer reach on the Web," says Samuel. "AAdvantage is one of our key marketing tools, and anything that we can do to make it more attractive benefits us."

The America Online deal has already earned at least one vote of confidence. "I'm an AOL customer, and I think that American is doing something very smart," says Richard Scherr, a western regional sales manager at Allegiance Health Care in Newport Beach, Calif., who logs more than 100,000 miles each year on American Airlines. "Now I'll be able to go to AOL directly and take care of scheduling my flights and watching my mileage. When you have to coordinate work and family, you have to manage your time carefully. They're creating brand loyalty." And that gets to the heart of what personalization and CRM are all about. **CIO**

Do you have an interesting customer-focused case file to share? Send your ideas to casefiles@cio.com. Louise Fickel (RiceKid@ix.netcom.com) is a freelance writer based in Denver.

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BY MALCOLM WHEATLEY

wireless

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European cell phone users already can take a piece of the wireless Web with them. Now the technology is poised to hit the United States.



Reader ROI

- Learn why wireless application protocol is worth examining for e-business apps
- See why Europe had a head start on the United States in deploying WAP-enabled applications
- Understand which kinds of companies are making big bets on the technology

The prospect is tantalizing. Imagine being able to access the Internet in much the same way that you do now—but from your cell phone. And not just for checking your e-mail while on the move, but doing serious browser-based stuff too: buying a book or CD, booking a flight, trading stock or just finding the location of the nearest Chinese restaurant or ATM. Or accessing your company's enterprise resource planning (ERP) system to check on the status of an order, expedite a shipment or approve a stack of purchase requisitions. Indeed, within the constraints of what can be displayed on a pocket-size screen, imagine being able to do anything that you currently do at the desktop—and some things that you can't, such as pointing your phone at a Coke machine to pay for a drink.

Somehow, *revolution* isn't the right word. But the mobile Internet is taking shape, and observers are predicting a paradigm shift greater than arrival of the personal computer. And a key part of it will likely be WAP, the "open standard" wireless application protocol that brings Internet connectivity to the cell phone. Although according to a joke making the rounds earlier this year in Europe, where the standard first took off, WAP means something entirely different. WAP, ran the gag, really stands for "Where Are the Phones?"—a reference to the fact that for almost a year the hype about WAP outstripped manufacturers' ability to bring devices to market.

Hence the broad smile on the face of Kent Thexton in early March this year. Thexton is managing director of British Telecommunications's (BT) Global Mobile Internet, a division of BT's mobile Internet company, BT Cellnet, and he's got the phones—or at least an awful lot of them.

BT's share price shot up 12 percent on March 9, when it revealed that—having launched Britain's first commercial WAP service back in January—it had secured thousands of oh-so-scarce WAP phones

from manufacturers such as Alcatel and Siemens. Twelve percent may not sound very much compared with Nasdaq's bungeelike gyrations, but for a staid British telco headquartered a stone's throw from London's St. Paul's Cathedral, it was certainly unusual—and indicative of the momentum gathering behind WAP.

For as little as £49.99 (around \$74 at current exchange rates), BT's stockpile of WAP phones would be offered to consumers and small-business users as soon as early April. "The mobile Internet is the future," says Thexton, pointing to the fact that there are already some 750,000 mobile Internet users. "America is now the only market in the world where Internet penetration is higher than mobile phone penetration. By 2003, more people will be able to access the Internet from mobile devices than from desktop PCs."

WAP's Promise

And WAP is how the industry hopes that they will do this. Simply put, WAP is an open, global standard that brings Internet connectivity to the mobile device—meaning to the cell phone initially, but soon to pagers and personal digital assistants, and ultimately to other portable and intelligent devices. Some 450 major telecommunications, software and hardware companies have signed up to the standard by joining the industry association promoting it, collectively representing over 95 percent of the global handset market, as well as carriers with more than 200 million subscribers.

Which is where WAP's strength lies: it's an open (and free) standard—any manufacturer can produce WAP-enabled devices, and any Internet site can output WAP-readable webpages (simply download the WAP technical specifications at www.wapforum.com). If pages already exist in HTML, converting to WAP is little more complicated

than stripping out slow-to-load graphics and reformatting the page to make it legible on the smaller screen of the typical mobile device. The resulting code is called WML (wireless markup language).

In Europe, that's already a reality: All these things can be achieved now, and new WAP services are springing up by the day. Consequently, using a WAP-enabled phone, it is perfectly possible to buy books or CDs from Amazon.co.uk or Amazon.de—respectively the Seattle-based online retailer's U.K. and German subsidiaries—but not, as yet, from parent company Amazon.com. (Though the company lets some U.S. cell phone users shop using an alternative called handheld device markup language, or HDML.) Europe, which has adopted the Global System for Mobile Communication





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SUNDAY, AUGUST 13

Registration

Riverwalk Golf Tournament

CIO hosts a golf tournament at the Riverwalk — San Diego's newly redesigned championship golf course.

Café 100 Reception

Meet other participants, Award honorees and Symposium Partners in our informal living room.

MONDAY, AUGUST 14

Registration and Breakfast

Opening Remarks and KnowPulseSM Poll

Gary Beach
Group Publisher
CIO Communications, Inc.

Be sure your views are represented in this groundbreaking poll.

CIO 100 Introduction and Welcome SYMPOSIUM MODERATOR

Geoffrey Moore
Founder and President
The Chasm Group

One of the world's foremost high technology gurus, Moore returns as the CIO 100 Symposium moderator and kicks off the program.

Culture on the Fault Line: How Large Companies Can Be Nimble in Technology-Enabled Markets

Moore provides new models to help analyze and change current business practices to meet and surpass the challenges of the marketplace.

Luncheon

From No to Yo! Making the Transition from CIO to CEO

Katherine Hudson
President and CEO
Brady Corporation

Katherine Hudson is president and CEO of Brady Corporation, a \$471M international manufacturer of identification and material solution products. Prior to Brady Corporation, Hudson was CIO of Kodak. Hudson discusses the advantages and disadvantages of being a CIO and how this affected her next step to CEO.

Industry Briefing Sessions

The Symposium Partners lead informative and innovative industry briefing sessions giving you the latest pulse on the information market.

Case Studies Highlighting the Latest Results on the Business to Business (B2B) Marketplace

Find out what the challenges are in forming these exchanges. Identify the success factors for these different trading models; how are they attracting suppliers and what are the long term benefits?

B2B PANELISTS

David Giometti
Vice President of Vendor Relations
Sears, Roebuck & Co.

Roberta Kowalishin
Vice President of Technology Ventures
CheMatch.com

Café 100 Reception

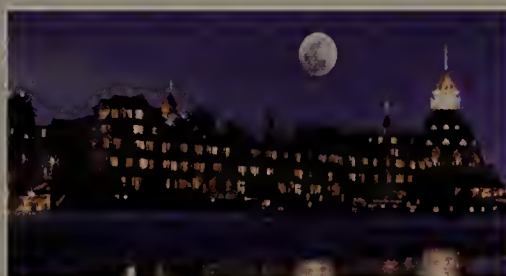
TUESDAY, AUGUST 15

Breakfast

Day Two Kickoff and Executive Exchanges on Customer Relationship Management

Moderator Geoffrey Moore
Founder and President
The Chasm Group

Customer relationship management (CRM) has become the mantra for organizations that want to move past cost-cutting measures to achieve growth, increase market share and build customer loyalty. Moore leads a discussion on the current CRM marketplace and its effect on the Internet, and sets the stage for an Award honoree presentation.



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Learn How American Airlines Soars to Meet Its Customers' Needs

Scott Nason
Vice President and CIO
American Airlines

John Samuel
Vice President, Interactive Marketing
American Airlines

A CIO 100 Award honoree, American Airlines has been a pioneer in utilizing technology to effectively meet its customers' needs. Scott Nason, vice president & CIO, and John Samuel, vice president of interactive marketing, share how they continually personalize their services to satisfy customers and increase revenues.

Fostering Creativity and Originality in Our Organizations

Mike Vance
Chairman and Co-founder
The Creative Thinking Association of America

Vance engages us in a lively discussion on how to cultivate continuous innovation and creativity in our organizations.

Through scores of dynamic and oftentimes humorous real life examples, participants learn how to apply these key strategies in their workforce and careers.

Luncheon

Executive Mindshare Sessions

Led by senior CIO Editors, these small intimate groups exchange experiences and solutions on the following topics:

- Developing and Refining Your E-Business Strategy
- Business to Business E-Commerce Success Stories
- Fostering Innovation in Your Organization
- Maximizing the Customer Relationship
- Leadership: New Economy, New Challenges

Bring ideas, questions, concerns and actual examples to the sessions.

Café 100 Reception

CIO 100 Awards Dinner and Ceremony

All participants are invited to attend a special black tie reception, dinner and awards ceremony on Tuesday evening recognizing this year's CIO 100 Award honorees. The "Oscars" of the IT industry, the event features champagne, a six-course gourmet dinner, and a presentation of the CIO 100 Award to all honorees.

WEDNESDAY, AUGUST 16

Breakfast

KnowPulse Poll Results

Lew McCreary
Editorial Director
CIO Magazine
Editor-in-Chief
Darwin Magazine

After the Business Plan: Internet Security

John Puckett
CTO & CIO
toysmart.com
Co-Chairman
Private Sector Council

John Puckett, co-chairman of the Private Sector Council in Washington D.C. and CTO and CIO of toysmart.com, addresses security threats. Are they real? What measures can be taken to achieve an acceptable level of security? Puckett also outlines how the best security plans and policies should be developed.

Leadership in the Age of Promise

Wesley K. Clark
Four-Star General
United States Army (Ret.)

Wes Clark, former Supreme Allied Commander of Europe, possesses one of the nation's most distinguished and significant records of military service. His leadership experiences have taken him from Vietnam to Latin America and ultimately to the position of NATO's Supreme Allied Commander. In this session, Clark presents a dynamic view of leadership based on honor, conviction and action.

Summary and Closing Remarks

Moderator Geoffrey Moore
Founder and President
The Chasm Group



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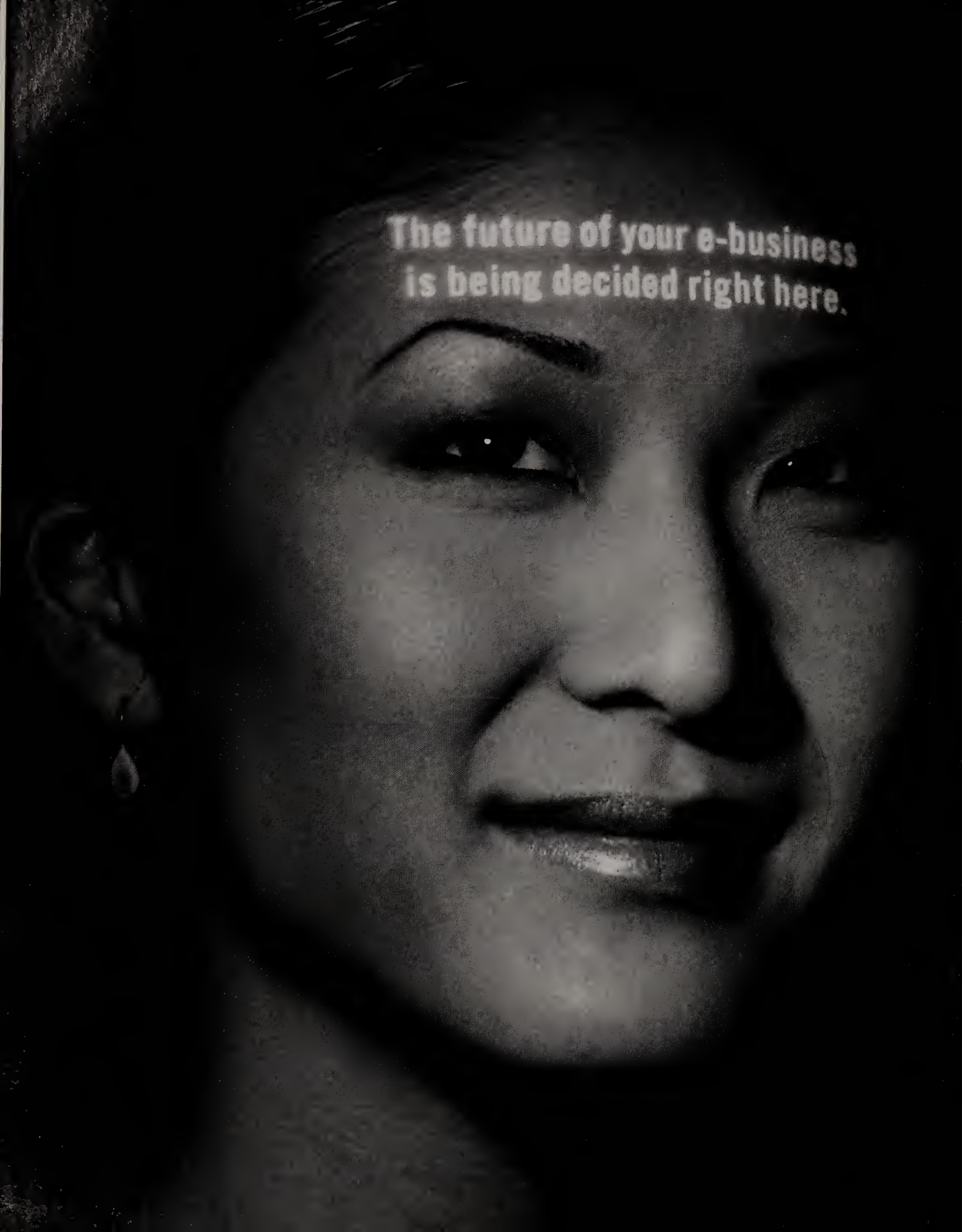
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(GSM) as its standard for mobile digital phones, has hundreds of commercial WAP services in existence, offering everything from travel bargains and Yellow Pages to the chance to bid on QXL.com, Europe's equivalent to eBay. (For more on WAP-enabled services available in Europe, see "A Continent Apart," below).

In the United States, where no one wireless standard exists, talk of such services is still limited: vendors like AT&T Wireless and the makers of the Palm VII handheld computer are positioning themselves to support the technology by offering WAP-ready phones and (in Palm Inc.'s case) licensing Phone.com's WAP-compatible browser. In Japan, NTT Mobile Communications Network's (NTT DoCoMo) i-mode, based on proprietary technology, illustrates the global appeal of a wireless Internet: The service created a sensation, attracting more than 6 million users in its first 15 months. Looking ahead, observers like market researcher IDC project more than 1.3 billion wireless Internet users will have WAP-capable devices in their hands by 2004.

All of which explains why Europe's head start with WAP is being watched so closely by Americans. Hundreds of millions of subscribers for whom their cell phone is—or will be—either a far more convenient way to access the Internet, or indeed the only way for them to access the Internet, have made the Continent a laboratory for the United States's own WAP endeavors. Even Microsoft has adapted. Robert O'Hara, manager of Microsoft's Wireless Telephony Group (Europe), says the company hasn't followed its usual practice when making a number of strategic WAP acquisitions in the last 12 months. "Most of the time when we buy a small company, we pick everybody up and move them to Redmond," he says. Instead, with the acquisitions of Sweden's Sendit AB and Cambridge, England-based

STNC in July 1999, Microsoft has left the people where they were. "Europe is where it's happening," says O'Hara, who is in the process of moving his family to Cambridge.

Ultimately, U.S. players will find ways to circumvent the problem of different telephony standards, believes Scott Goldman, CEO of WAP Forum Ltd., the WAP industry association based in Mountain View, Calif. The pieces are already moving into place.

GSM carrier VoiceStream Wireless has been making a lot of acquisitions in recent months, says Goldman, observing that there's pretty much a national footprint now—and where there isn't, there's usually a roaming arrangement supporting users who may look to access WAP-enabled applications. "Only Dallas and Chicago don't yet have a GSM service," though both cities have companies working on it, he says. Other carriers will swing into line as WAP gathers momentum. "The closest [thing to WAP] is Sprint's Wireless Web, which is a pre-WAP service," says Goldman. "However, Sprint is a member of the WAP Forum and is committed to convergence." The bottom line is that the United States will see some sort of commercial WAP service by the fall.

And the nature of that service will likely be crucial to the success of WAP in the American market, if its arrival isn't bogged down by the "so what?" factor. As Goldman observes, "Americans are much closer to having news, sports, stock prices and banking very much closer to them—electronically speaking—than are Europeans, thanks to America's very much higher level of computer and Internet penetration. In Europe, that's not the case, and WAP devices and services will be offering individuals capabilities and services that they don't currently possess."

A Continent Apart

In Europe, technology standards and consumer-friendly services gave WAP a head start



When it comes to the wireless application protocol (WAP), "the U.S. is one to two years behind Europe," says Monica Hamilton, the Irving, Texas-based director of the global strategic partnership program at Nokia Internet Communications. Three factors explain Europe's wireless revolution and the widespread unveiling of WAP-compatible applications.

1. Adoption of a continentwide mobile digital telephony standard. The U.S. telecommunications market sports three different digital stan-

dards, plus one still widely used analog standard—and carriers, Hamilton says, have been reluctant to change. "AT&T has one proprietary solution, Sprint another—and there's a fear of loss of control and revenue," she says. Europe, meanwhile, has rallied around one: GSM, the Global System for Mobile Communication (formally, the Groupe Special Mobile, after the European bureaucrats who created it in 1987).

Resulting economies of scale lowered handset prices and connectivity costs. So while only one in five European households owns a PC, levels of cell phone penetration are higher—46 per-

Business Apps Still in Early Stage

Corporate applications for WAP technology, meanwhile, have tended to follow mobile workers such as truck drivers, field service people and traveling salespeople, says Cindy Dahm, director of Europe marketing for Phone.com. It was Phone.com, then called Unwired Planet, that in 1995 first designed the communications protocols that formed the basis of WAP. With applications taking advantage of the technology, Dahm says, "You can respond to customers' needs much more quickly, even while you're in their office." The real problem, she adds, is that outside these narrow application areas businesses haven't really begun to think about how they could, or should, use a device "that sits in your pocket and is on all the time, even when your laptop is switched off and in your briefcase."

"There's a visualization problem," agrees Mike Short, chair of the London-based Mobile Data Association. "People tend to think of mobile phones as having tiny screens and a small typeface. They're

going to get bigger, without a doubt. Think of them as Palm Pilot-size devices, with Palm Pilot-size screens." And the visualization failure also extends, he adds, to understanding quite what a revolution it will be to have a corporate intranet that is everywhere—and accessible without a costly laptop.

Clearly, businesspeople on the move will be first to use their WAP devices to buy their own airline tickets and reserve their own hotels, Short says. And the first uses of WAP within the corporate world are likely to be exactly this kind of thing: an application that has a consumer feel to it but happens to be deployed in a corporate environment. Others, such as Justin Chamberlain, head of corporate ventures at the London-based national headquarters of cell phone manufacturer Ericsson, highlight the synergies possible when WAP devices are also equipped with Bluetooth, the open standard short-range radio technology that is due to be incorporated in devices in the coming months.

There are no technical barriers, he points out, to using WAP devices to capture micropayments—car parking fees, vending machines and so forth. Still others, such as Nokia's Hamilton, see the potential of building bar-code readers into WAP devices. "You're standing in Barnes & Noble looking at a book, and you [use your] wand—or just type, if the phone doesn't have a bar-code reader—the bar-code number into the phone, which then tells you how much it's selling for at Amazon," she says. Do you order it from Amazon while standing in Barnes & Noble? Or show the register clerk the price you could get at Amazon and invite them to follow suit?

And Madison Avenue is starting to think about advertisements



cent in the United Kingdom, more than 60 percent in Finland—and rising. The number of cell phone subscribers topped 140 million in 1999, up from 93 million the previous year.

2. Flexible pricing and payment models for wireless services encourage Europeans to sign up. It costs nothing to receive a call on a mobile telephone—that's taken care of by the subscription. Outgoing calls cost, sure, but incoming calls are charged to the person making the call. Now roll in flexible payment options: The usage of prepaid cards is growing,

with replacement cards available at most newsstands and gas stations. It's a pricing structure made for kids—parents routinely buy their teenage children cell phones as an easy way of both keeping tabs on them and providing emergency backup at low cost.

3. European cell phone users have latched on to the capabilities of digital technology. Besides the improved clarity of digital calls, compared with crackly analog connections, Europeans have come to appreciate other features. Short message service (SMS) technol-

ogy allows users to send brief, 160-character "pager-like" text messages to each other, a facility hugely popular with youngsters. In March, German mobile subscribers exchanged over a billion SMS messages, while U.K. users sent and received 360 million, according to Mark Smith, communications director for the GSM Association in Dublin, Ireland. The service travels: With SMS, you can send text messages from a cell phone or PC to other cell phone users connected by more than 355 operators in 132 countries.

—M. Wheatley



too: Although cell phones by their very nature provide some indication of where the phone is physically located, devices equipped with global satellite positioning (GPS) technology will be able to fix their position to within a few feet. And whereas advertisers can only identify a particular PC used to access the Web (and not the actual user), cell phones are registered to a real person, says Owen Davis, managing director and founder of New York City-based Thinking Media, a service that provides wireless tools for businesses. Consequently, they can—groan—zap you an ad for the nearest restaurant or point to the specials at Joe's Diner. "There are huge privacy issues [with WAP]," says Davis. "Permission-based marketing is going to be extremely important in the wireless data advertising space—my guess is that most ads will be sent only to those who explicitly agree to receive them."

But to begin with, most businesses' introduction to WAP will come

and general manager of supply chain applications at PeopleSoft in Pleasanton, Calif. PeopleSoft developers have been working on WAP since last fall, he adds, and early applications include order status checking, pricing and availability, requisition approvals, and expense management logging. "It's been amazing how quickly we were able to make the prototypes work," he adds. "The business logic is the same: The client personal digital assistant or cell phone simply needs a WAP display, not an HTML display."

A similar story emerges at SAP. "We're WAP-enabling the mySAP.com workplace so that it becomes a mobile workplace," says Martin Hofmann, head of the Mobile Workplace group of the Internet Business Framework department of SAP in Walldorf, Germany. Since the mySAP.com workplace covers all functions of every SAP product, he continues, employees will be able to do everything from approving vacations and purchase requisitions to checking on the status of an order, all from their WAP device. "Even some small reports—but only those that make sense

on such small devices," he enthuses. "If it makes sense to put it on a mobile device, we'll put it there. If it doesn't, we won't."

Even so, this amounts to little more than mapping today's functionality onto a WAP-enabled world. What of wholly new functionality? It turns out that some interesting glimmers are emerging. At CGU, one of the United Kingdom's largest insurance companies, a WAP development effort is under way to not just enable mobile workers, such as claims adjusters to keep in touch with the office more readily, but to communicate with outside contractors as well.

"One of the biggest elements of our purchase spend is property repair on behalf of our insurance customers—around a half billion pounds [\$740 million] each year," says Alf Noto, director of supply chain and purchasing at CGU's London headquarters. And it's one of the biggest headaches too. The problem: builders, plumbers, glaziers and the like aren't sitting at home by the phone waiting for

To begin with, most business introduction to WAP will come from enterprise software vendors that incorporate WAP functionality into their products.

from enterprise software vendors that incorporate WAP functionality into their products. "Essentially, any corporate activity with workflow processes and approvals can be sent to a wireless device just as easily as a fixed-point desktop," says Mike Fransden, vice president

CGU to call. But they do carry cell phones—and WAP offers a way of quickly communicating with repairers, finding out if they're available and scheduling them to do the job.

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A Familiar Web Language—and a Rival for WAP

As wireless products and services evolve, the wireless application protocol (WAP) is unlikely to be the only standard technology to view websites from a mobile device. Hypertext markup language (HTML), the lingua franca of websites designed for PC browsers, is far from dead in the water. Many vendors, in fact, continue to assume there will be a dual-browser world where they must support WAP and HTML—at least until it's clear how WAP's long-term prospects shape up.

Among those pursuing this path are Microsoft, with its Mobile Explorer platform for cell phones and other devices, and SAP, which has built a product called Internet Transaction Server to bring information from enterprise resource planning systems to mobile users. British telco BT is actively working with Microsoft to develop a mobile HTML browser. And phone manufacturers are building handsets that contain both WAP and HTML browsers.

Why? Market share is an important consideration: Despite being clunky in the mobile world, HTML has a head start, and WAP's advantages may not be enough to persuade businesses to effectively publish all their webpages twice—once in HTML and again in WAP. With corporate applications, this is an important consideration, says Kent Thexton, managing director of BT's global mobile Internet business: Rewriting corporate intranets for WAP can be avoided if HTML devices can somehow do the job, even if it means a user must scroll around to see a complete screen.

Consider this thought experiment. Take a computer-type device—a small laptop or a larger Palm handheld, for example—and build telephony capability into it. Make it suitable for voice as well as data with a small microphone and speaker, just like today's multimedia laptops. The result? You've just built a device that has a usable screen for data and HTML viewing as well as a phone you can use to call the office. It isn't a laptop as we know it; it isn't a phone as we know it—but it could be the future, and it would work on HTML just as well as WAP.

—M. Wheatley

TO LEARN MORE ABOUT WAP

The WAP Forum www.wapforum.org

Nokia www.nokia.com

Ericsson www.ericsson.com

GSM Association www.gsmworld.com

Phone.com www.phone.com

World Wide Web Consortium (W3C) www.w3.org

Mobile Lifestreams www.mobilelifestreams.com

way for repairers to efficiently communicate the fact that they've carried out the repair, invoice CGU and thus trigger a bank transfer payment. "We're dealing with 20,000 suppliers," says Noto. "At times it feels like everybody with a toolbox in the entire country sends us an invoice at some point or other."

Other experts see WAP applications reaching further, to link business transaction systems not just to workers but to other machines as well. "I can envision countless 'smart' devices that interact with a central application system—vending machines, storage tanks, material handling equipment, vehicles and so on," says Jim Shepherd, senior vice president of client research at Boston-based AMR Research. "These would not just be data collection points but—for instance—a storage tank that could send status information, receive schedule updates, calculate replenishment requirements, and transact material receipts and issues."

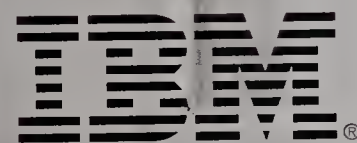
It's an exciting prospect, and somehow more believable than envisioning corporate America getting fired up over authorizing vacation requests and purchasing requisitions online. Yet there's a catch. And that, says Simon Buckingham, managing director of Newbury, England-based WAP consultancy Mobile Lifestreams, "is that the WAP standard was released in stages, and the handsets on sale today support only WAP 1.1." So? Push applications, says Buckingham, where the WAP device isn't the one initiating the call, are covered by WAP 1.2, which should have been finalized in mid-1999 but ran late. The most recent version of the protocol also includes stronger security features. Significant numbers of WAP 1.2-enabled phones won't be on the market until mid-2001, he estimates.

Meanwhile, developers and consumers will wait to see if WAP catches on—but judging its success on what Buckingham regards as a flawed, suboptimal version of WAP that should never have been released.

With every day that passes without WAP 1.2 devices on the market, the risk increases. But this time, the WAP joke is on the industry, not the patient consumer—and could yet backfire. Hey guys, where are the phones? **CIO**

How are you using wireless technology? Write us at letters@cio.com. Malcolm Wheatley can be reached at malcolm_wheatley@compuserve.com.

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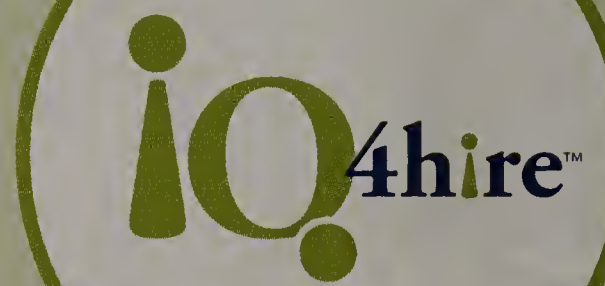


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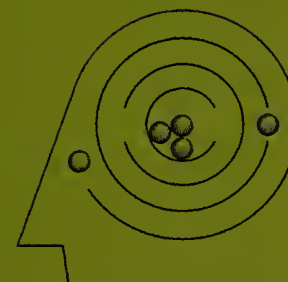


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Is ethical business decision making an oxymoron? Author Jeffrey Seglin talks about how to manage with a conscience.

BY ELAINE M. CUMMINGS

In fall 1982, Johnson & Johnson faced a crisis when seven people from the Midwest died after ingesting cyanide-laced Tylenol capsules. News of the murders traveled quickly and caused nationwide panic. And although Johnson & Johnson was certain the tampering had not taken place at its plants, the company was nevertheless concerned with protecting its reputation and its most profitable brand of pain reliever.



For author Jeffrey Seglin, ethical decisions are a search for solutions that feel comfortable for all parties involved.

Marketing experts predicted that the Tylenol name would be doomed. "I don't think they can ever sell another product under that name," advertising guru Jerry Della Femina told *The New York Times* soon after the ordeal.

Although unlikely to be held responsible, Johnson & Johnson's top management knew they needed to act quickly. In what was only later recognized as a stroke of marketing genius, the company decided to put customer safety first and profit second. Johnson & Johnson briefly halted all Tylenol advertising and eventually recalled more than 22 million bottles of capsules at a cost of approximately \$100 million.

Such a move could hardly have been seen as acting in the best interests of the company's stockholders. But almost instantly, Johnson & Johnson was praised for its socially responsible actions. Shortly thereafter, Tylenol returned to the market in new tamperproof bottles, and today it's still one of the top-selling over-the-counter drugs in the country.

Have you and your managers talked about how to handle such a predicament? Author Jeffrey Seglin recommends you take the time to do so. And not just for the looming emergencies, but for everyday decision making as well. "Rather than thinking of ethics as the benchmark against which behavior is measured, for many people ethics has become something that always inflicts pain on a company or requires some hefty sacrifice," says Seglin.

By drawing a distinction between behavior based on a fear of litigation and behavior driven by ethics, Seglin demonstrates in *The Good, the Bad and Your Business* the importance of making tough business decisions with a clear sense of right and wrong. He talked with Contributing Editor Elaine Cummings from his office at Emerson College in Boston, where he teaches in the graduate department of writing, literature and publishing.

PHOTO BY FURNALD/GRAY

CIO: The premise of your book is that in business, we're constantly making decisions that affect three spheres: money (finance, sales and so on), people (our employees, our bosses and their families) and the common good (the society at large, including the environment and competitors). The challenge, you write, is to find the place where the needs of all three areas overlap. How realistic is it to claim that you can perfect this technique?

Seglin: The short answer is that you can't perfect it. In fact, it could very well be that the decisions you make about a situation or dilemma you're facing may differ from week to week or even day to day depending on the factors that are in play.

If it's a moving target and impossible to perfect, what's the point of trying?

The point of trying is that the world of business, which was built on the belief that you checked your personal values when you entered the office door, has changed. A more enlightened view has taken hold that recognizes it's impossible to leave our personal values at home and not have them affect the way we do the things we do.

But then how do decisions ever get made? Isn't it always a game of trying to keep the needs of each constituency in balance?

Part of what I write about in *The Good, the Bad and Your Business* is the need CEOs, CFOs, CIOs and other managers have to make important decisions with often incomplete information. In fact, I argue that it's more destructive to a business to be indecisive—for its managers to add layers of ambiguity to a situation that's already ambiguous, since no one knows exactly how a decision may play out. My point is that examining the effect various decisions might have on people, money and the common good can be a very effective way of making tough choices.

Don't legal and regulatory restrictions also help you make tough decisions?

Well, perhaps. But making a choice—

whether it's good or bad—based on legal reasonings or fear of litigation can lead to a whole smorgasbord of new problems. Let's take the example of giving references for former employees. The prevailing advice given by human resource departments and labor attorneys is that to avoid a potential lawsuit from a former employee, you should give only name, rank and serial number. Well, there are a few problems with this. First, as I point out in the book, the number of lawsuits against former employers for having given bad references is negligible. Secondly, this mind-set renders managers unable to give a good review for someone who did a great job, and conversely it prevents them from warning a colleague in the

field of a potential disaster. Overall, the fear of litigation over giving references has resulted in behavior that penalizes both good employees and prospective employers. Managers are afraid of giving out frank references and suspect that they're not getting them from other managers, either.

What are you saying? To ignore legal advice?

Not at all. But legal advice is just that. It's the lawyer's job to give you carefully thought-out ways to avoid litigation at all costs. Sometimes though, doing the right thing outweighs the perceived risk of litigation. Here's an example. There's a dirty little belief among managers that hiring a minority employee is just opening oneself to trouble, since it's assumed to be harder to get rid of a minority employee if he or she doesn't work out. Well, for one thing, there's little in the way of statistics to support this. For another, it forces managers to make abhorrent decisions about hires based on unfounded fears. If anything, the real fear is of having to fire anybody for any reason since most of us hate the task.

In the digital economy, the rules are still being written. How do you behave in a world with nascent rules?

The biggest challenge in an environment where the rules are still being formed is to disclose as much as possible. For example, if your company has been sued, and all of the past year's e-mail from every employee within the company has been subpoenaed as evidence of your company's consistent

pattern of bad-mouthing a former vendor or partner, then you'd think the smart thing to do, regardless of whether you won or lost the account, would be to let your employees know that experiences like this one are precisely the reason you instituted an e-mail policy that warned them against using e-mail for inappropriate or nonbusiness dealings.

An example of a frivolous lawsuit that cost the company valuable time is a lot more understandable as a reason than using the "I'm the boss, that's why" explanation. Many companies though would rather not disclose their own embarrassing mistakes to their employees.

Why is it that businesspeople have such a hard time conceiving of and discussing the ethical dimensions of their work?

Because they assume that for something to be ethical, it has to cause pain to the business and its people. There's the example of a class of MBA students who were asked to comment on the ethical decision making by the leaders of Johnson & Johnson when they pulled millions of dollars' worth of Tylenol off the shelves in the early 1980s after some capsules laced with cyanide caused deaths. Many of the students argued that it wasn't an ethical decision at all since Johnson & Johnson ended up getting great goodwill as a result of the way it handled the situation. The students believed that without pain and suffering, the case wasn't really about ethics.





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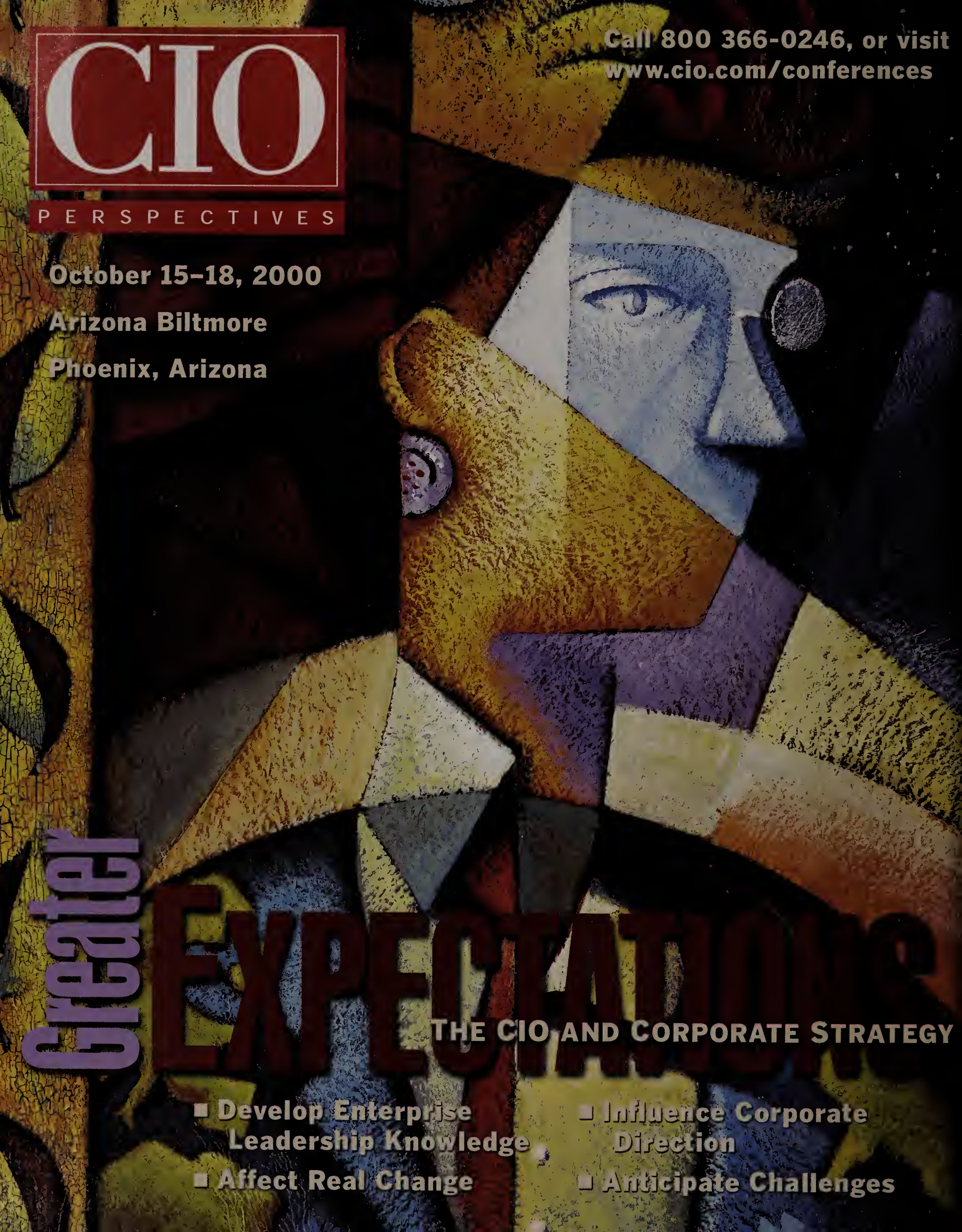


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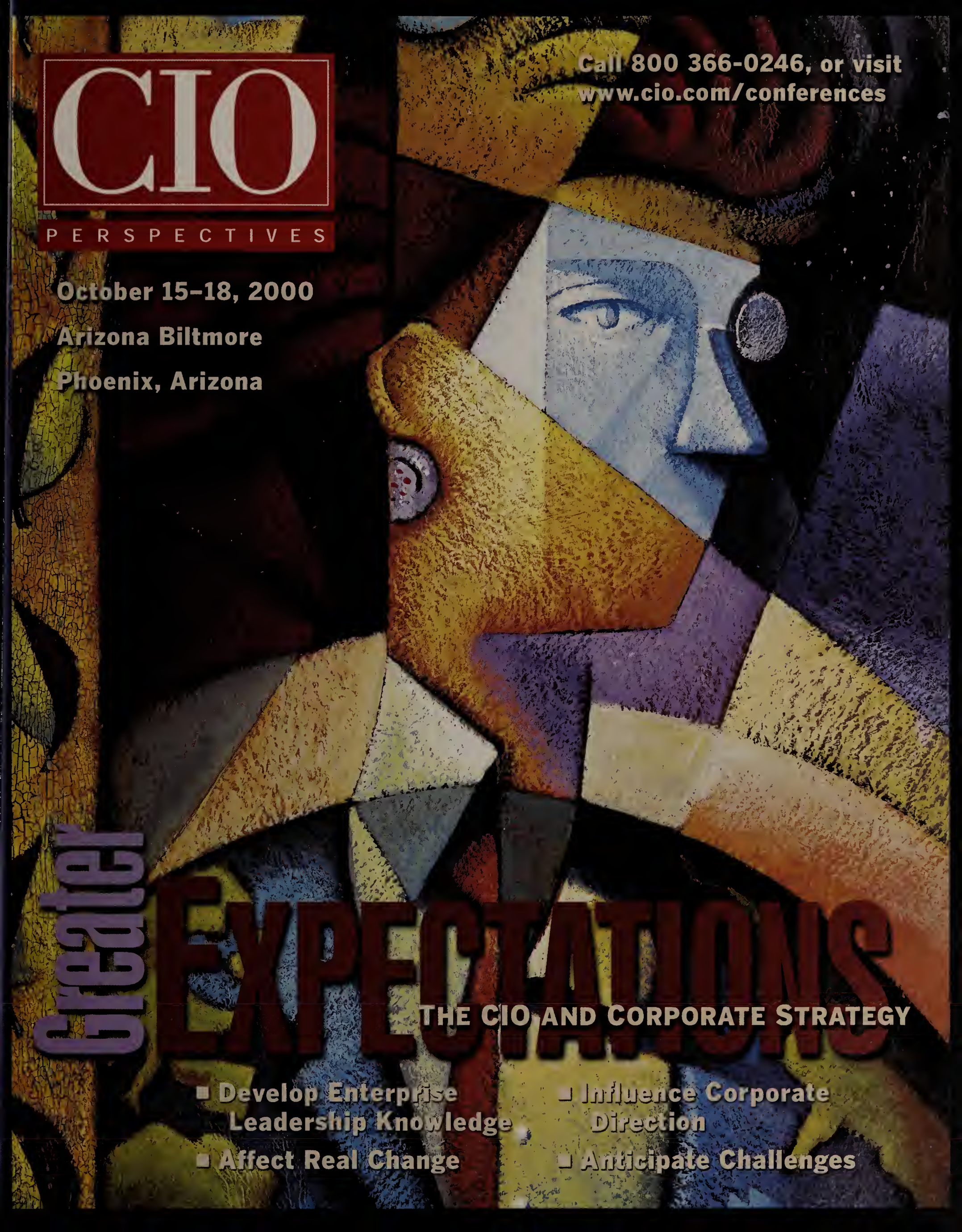
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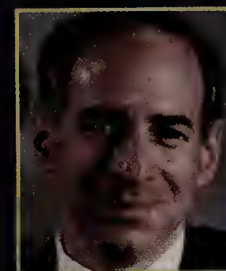
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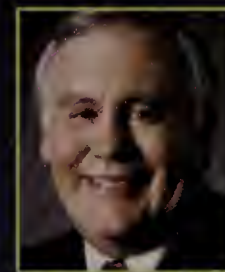


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So what would be your response to that thinking?

Well, using the same example of the Tylenol situation, I'd say it's crucial to remember that although the public responded positively to the company's actions and the brand survived and flourished, J&J's executives still had to make a lot of tough decisions in a brief, horrible period of time. It was clearly an example of ethical decision making.

Doesn't your recommendation about considering the consequences of behavior on the outside world (others, the environment) remove ethics from its

proper sphere—namely, being true to your own internal value system? After all, isn't intent the foundation of our legal system's means of ascribing right and wrong?

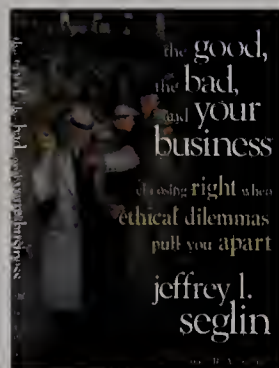
If your own value system allows you to cause harm to others, then it's inappropriate behavior. That's why I believe you need to weigh how your decisions will affect all of the constituencies involved. People like to think that they can feel good about a particularly grueling decision if they can sleep at night or look at themselves in the mirror after making the decision, or by gauging whether they'd feel OK reading about their

decision on the front page of *The Wall Street Journal*. Well, that may work for people whose internal values are respectful of others. But as Joe Badaracco, who teaches ethics at Harvard Business School, points out, if Mother Teresa had a few sleepless nights and Adolf Hitler slept soundly, it'd say more about their respective internal values than it would about the rightness or wrongness of their decisions. **CIO**

Want to share your thoughts on an ethical dilemma you've faced? Contact Contributing Editor Elaine Cummings at cummings@cio.com. Author Jeffrey Seglin can be reached at jseglin@post.harvard.edu.

DO THE RIGHT THING

An excerpt from Seglin's The Good, the Bad and Your Business on the nature of ambiguity in business ethics



The Good, the Bad and Your Business: Choosing Right When Ethical Dilemmas Pull You Apart

By Jeffrey L. Seglin
John Wiley & Sons Inc.,
New York, \$27.95
March 2000
www.wiley.com

IN AN INCREASINGLY COMPLEX BUSINESS world, there's a tendency among people to want unambiguous answers to what can only be ambiguous situations. I was reminded of this in a seminar I conducted for graduate students of Harvard Business School and Harvard Divinity School to discuss the language of ethics in business, or, more specifically, how people in business talk about the ethical decisions they make.

At each session, we focused on a different case study and talked about the decisions the various characters in the case made about the ethical dilemmas they faced. What was particularly heartening to me was that here was a group of graduate students as far apart from one another on the physical campus of Harvard as you could possibly be and, you'd think, as far apart philosophically about what's right and wrong in business behavior. But that wasn't the case. The business school students took as much issue with questionable behavior as the divinity school students did. The wonderful part about

the discussions was that these people from different parts of the academic world with vastly different vocational goals brought passion and insight to the exploration of how people in business make difficult choices when facing the needs of competing constituencies. They recognized the difficulty of the decision-making process that occurs when tough choices need to get made that cut across academic lines.

But more than once, when it became clear that no matter what choice a character in one of the cases made, he or she would be giving short shrift to the needs of some group—the customers perhaps, or the environment, or maybe the employees—a student in the seminar would blurt out, "There must be rules for this sort of thing; just tell us the rules."

The rest of the class would then pounce, saying what the blurter undoubtedly knew—namely, that there are no universal answers that address all of the tough decisions that get made in business day in and day out, regardless of the scope and scale. Sure, there are some regulations and laws that gov-



ern how we behave. And certainly, some industries have rigorous codes of ethics that govern what's acceptable and what's not acceptable behavior....

In business, we're all searching for a comfortable way to navigate these decisions. By comfortable, I don't mean complacent. Business is a dynamic, fast-paced thing, and we can hardly stand idly by hoping that the

answers to our dilemmas will be revealed to us in a puff of smoke or a revelatory strike. That's why trying to come to an understanding of how to talk about ethics in a meaningful way is so critical to the operation of a business. We need to be able to understand the context we're operating in and to make decisions fully informed with a clear sense of right and wrong, so we can weigh out the

tough decisions we need to make to stay honed for competition.

The comfort we're looking for is that place where we can continue to stay a lean, mean, profit machine, but at the same time do it with an understanding of what we stand for in the way we make choices and decisions. Contrary to some popular thinking, being ethical in business and generating profits do

not need to be mutually exclusive actions....

Comfort does not equal complacency. Nor does the search for it translate into poor performance.... If you buy into the argument that the only responsibility of a business is to its stockholders and that paying attention

ditionally think of as part of the economic bottom-line business function but which we have to factor into our decision making all the time. How do you manage all of these issues in the context of how you run or do your business?

What comforts us in one area may not do so in another.

It would be nice and clean if we could think of the three areas as interlocking circles—as in a classic Venn diagram. And it would be neater still if we could say that the area of comfort we're searching for is that small area where all three circles overlap. But alas, it's just not that simple. Finding that comfort level is finding a spot that shifts and mutates moment to moment, decision to decision....

But there's no universal code of ethics that governs how everyone should behave and everything should be done in the business world.... Business is too vast, too wide in scope, too all-encompassing to come up with a magic list that spells out what should and shouldn't be done in every situation....

There are times where it certainly would be nice to have a list, a guide, something to fall back on when you get embroiled in those nasty choices that make you wonder about your own behavior.

Who wouldn't want to be able to pull out a code of ethics and work down the list:

- Did I steal? Check.
- Did I lie? Check.
- Did I kill someone in the process of making payroll? Check.

But one of the sad byproducts of overreliance on industry codes or governmental regulations is that it frees up people caught in the heat of a decision from having to think through the implications of their actions.

That's where the real work gets done, the hard thinking, the coming to terms with the implications of your actions. When you make choices solely on what the law will and won't allow, you free yourself from taking any moral responsibility for your actions. And what fun is that? It's like spending your life as an automaton waiting to be told how to behave, how to make the tough choices that define you, the way you do business, and the way you live your life. **CIO**

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WE NEED TO UNDERSTAND CONTEXT WITH A CLEAR SENSE OF RIGHT AND WRONG TO WEIGH OUT THE TOUGH DECISIONS

to areas outside of this will result in a lesser-performing company, the research of two Harvard Business School professors suggests just the opposite. John Kotter and James Heskett studied the performance of 207 large firms over an 11-year period. They wrote of their findings:

Corporate culture can have a significant impact on a firm's long-term economic performance. We found that firms with cultures that emphasized all the key managerial constituencies (customers, stockholders and employees) and leadership from managers at all levels outperformed firms that did not have those cultural traits by a huge margin. Over an 11-year period, the former increased revenues by an average of 682 percent versus 166 percent for the latter, expanded their workforces by 282 percent versus 36 percent, grew their stock prices by 901 percent versus 74 percent, and improved their net incomes by 756 percent versus 1 percent.

—John P. Kotter and James L. Heskett,
Corporate Culture and Performance
(The Free Press, 1992)

[Our search is for] a comfort level among the conflicting spheres of business we operate in. While there are overlaps in these spheres, I've divided the exploration into three areas of business that we all commonly deal with. The first is money, the second is people, and the third is the common good, which includes all of those areas that we don't tra-

The money and people aspects of managing a business are pretty obvious—they are the critical ingredients to all successful businesses. While we need to make them on a regular basis, these decisions are often loaded with moral ambiguity, packed with the stuff about which ethical decisions are made.

The money decisions are the difficult decisions company owners and managers must make when faced with trying to keep cash flow strong enough to keep a company running. Shortages of cash can make the most honest of us consider behavior we never would have anticipated.

The people issues deal with issues directly involving people in the workplace, whether it be deciding how far to go to help a troubled employee, what stance if any to have on romantic relationships between coworkers, how and what to communicate to the rest of the workforce when an employee is fired, and how employees pass between personal and business lives when the line grows constantly blurrier.

The third part—the common good—includes such things as where we draw the line between posturing and lying, if and how we legitimize spying on competitors, and how our operations affect the environment.

Obviously, our dealings with these three spheres are not so cleanly segregated in our day-to-day business lives. They overlap—decisions we make about money often involve people, and those we make about issues relating to the common good frequently touch on the other two as well.

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Offshore outsourcing isn't new, but thanks to a chokingly tight IT labor market and the zero-time-to-market demands of the Internet, more and more companies are contracting with offshore firms for everything from legacy-system maintenance and customer service to development of mission-critical applications and commercial websites. Read how they've done it.

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Edited by Christopher Lindquist. Send your thoughts and ideas for future columns to et@cio.com.



Cash Makes a Comeback

Digital money finds a home with the credit-card-less BY JOHN EDWARDS

FOR PACIFIC SUNWEAR of California, selling sportswear on the Internet sounded like a sure-fire idea, until company managers realized something: Most of their potential customers didn't have credit cards.

With a target customer base of 12- to 22-year-

olds, the company either had to find an alternate online payment mechanism or reconsider the entire idea of e-tailing. "Many of our customers would have been forced to ask their parents to let them use their bank card or to sit with them while shopping," says Ron Ehlers, vice

digital cash...telecommuting...new processors...optical networking

president of information services for the Anaheim-based company. "In any case, we were going to lose potential customers."

Pacific Sunwear's solution was to create a two-pronged sales approach: accept major credit cards from those who had them and utilize the services of digital cash vendors as a convenient way of dealing with those who didn't. That way, kids with cards could shop online in the usual fashion while their less-fortunate brethren could open a shopping account

cash can be used alongside credit cards in certain situations, or in areas where it isn't practical to use a credit card," says Michele Pelino, the program manager for the Internet market strategies planning service at The Yankee Group, a Boston-based technology research firm.

The discovery that digital cash couldn't effectively compete against credit cards was bitter news for the industry's pioneers. Most first-generation digital cash vendors, such as DigiCash and CyberCash, are now either defunct or have expanded their

"The new concept is that digital cash can be used alongside credit cards in certain situations, or in areas where it isn't practical to use a credit card."

*—Michele Pelino, program manager for
Internet marketing strategies at The Yankee Group*

by having their parents send a check to a digital cash provider. Pacific Sunwear opted to use digital cash services offered by RocketCash, iCanBuy.com and DoughNet—three providers that focus primarily on younger shoppers. "Now customers without a bank card can shop our site by entering through a portal created by the digital cash company," says Ehlers.

Changing Times

After years of struggling to find a sustainable marketing strategy, digital cash vendors hope they can finally seize success by targeting special-case Web merchants, such as Pacific Sunwear, and other niche markets with specific payment hurdles. As consumers have become accustomed to flinging their credit card numbers across the Internet, the long-held hope that digital cash technology would become a credit card substitute has been all but abandoned. "The new concept is that digital

focus to include multiple payment types and new technologies. "The commerce model that was originally envisioned simply didn't pan out," says Pelino. "The industry had to change or die."

Second-generation digital cash vendors have learned to stop fighting credit cards and work within the system. "Going head-to-head against credit card companies didn't make sense," says Jeffrey Mason, president and CEO of RocketCash, a Mountain View, Calif.-based digital cash vendor. "We're looking to provide a service that credit card companies can't or won't offer."

Hard Currency

The goal is to make life easier for consumers. But installing a digital cash system can be a major—and potentially painful—undertaking. "It was actually rather difficult," says Cara Santiago, e-commerce marketing director for shoes and fashion accessories retailer Steven Madden Ltd.

new products

Swimming a Data Sea

DolphinSearch has released a product designed to help failing corporate memories. The company's **KnowledgeBox** reportedly utilizes research about the cognitive process of dolphins to create a search tool not for navigating ocean currents but for discovering hidden knowledge inside online corporate documents. Users attach the KnowledgeBox to their networks, configure it to search specific directories, and let the box index documents using fuzzy logic techniques. Employees can then search for documents through a browser-based interface. The KnowledgeBox supports a variety of file formats, including Microsoft Word and Excel, PDF, Lotus Notes and HTML. The box will be available this summer for a list price of \$10,000. For more information, visit www.dolphinsearch.com or call 805 640-9984.

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The New York City-based company recently implemented a RocketCash-based payment system but encountered headaches when it tried to force-fit the technology into an existing Web e-commerce environment that was visually attractive but short on order tracking and other key e-commerce support features. In the end, it took the development team several months to iron out a series of glitches. The experience didn't dampen Santiago's enthusiasm for digital cash technology, however. "It's worth pursuing," she says, "but it will work easier

e-commerce markets. Their rationale is simple: as purchase prices drop, the cost of processing transactions rises dramatically. The fixed costs of processing credit card transactions less than a dollar consume almost their entire transaction amount. For transactions less than \$20, digital cash is less expensive than processing credit cards in-house. This is particularly true for transactions of less than \$5, where digital cash processing costs can be 25 percent to 50 percent cheaper than dealing with a credit card company. "In the convenience e-commerce market, using a credit

Digital cash companies stand to face stiff competition from established credit card companies, which aren't likely to let a bunch of startups run away with a burgeoning industry.

when you have a solid, standardized shopping cart foundation."

As e-commerce changes, digital cash may increasingly become worth the trouble. A growing interest in micropayments—charges too trivial to justify the use of a credit or debit card, such as paying a dollar or so to download a single song, a particular picture or a lone news clip—will help the digital cash industry turn the corner, says Judith Rosall, research director of Boston-based Aberdeen Group. Rosall says that the technology's moment has arrived. "Digital cash technologies will begin growing in adoption and acceptance in the next two years and will contribute to significant worldwide e-commerce market growth, particularly in the sales of digital content, digital music and online gaming," says Rosall.

Digital cash vendors are hoping that micropayments will open untapped

card is like writing a check for a pack of gum," says Benjamin Herzberg, former director of partner development for ExchangePath, a digital cash vendor in New York City.

Like many digital cash vendors, ExchangePath requires users to establish and fund an account that's debited as the customer makes purchases. Several other vendors, such as Seattle-based QPass, combine micropayments into a single monthly charge that's sent to a major credit card account supplied by the user.

While micropayments could work for any type of inexpensive product, shipping costs tend to limit purchases to items easily delivered directly onto shoppers' computers. As a result, digital cash vendors hope to convince magazine and newspaper publishers, as well as other content providers, to charge a modest fee for the materials they currently give away. ExchangePath, for example, has payment

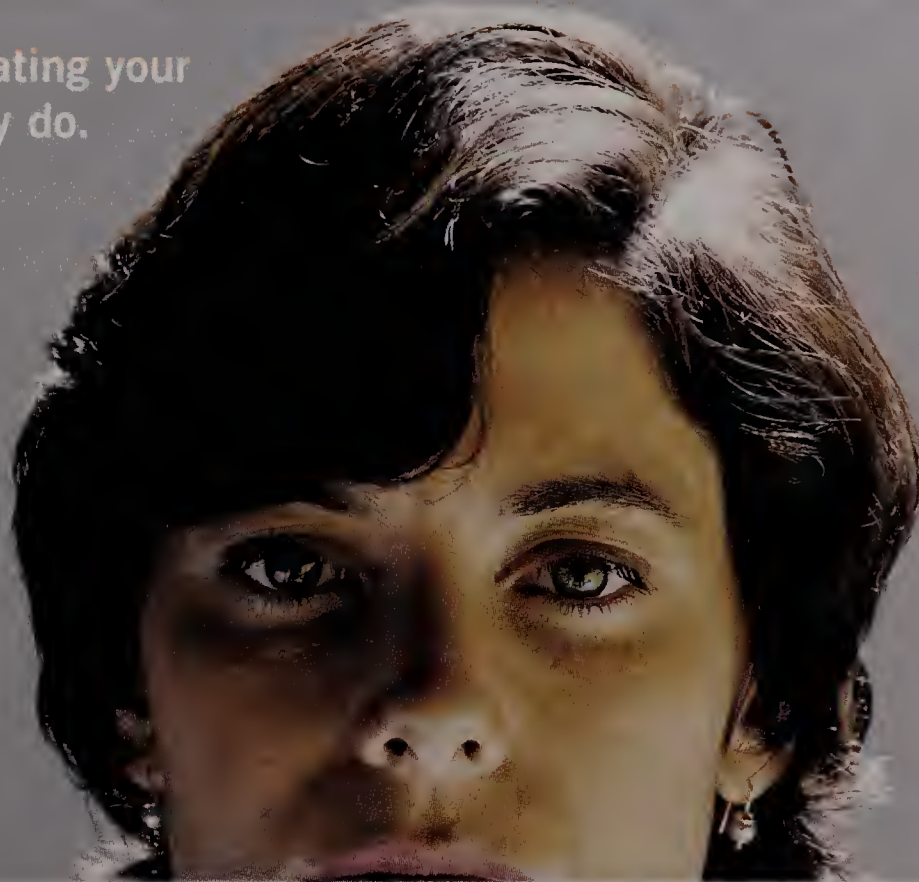
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The goal is to make life easier for consumers. But installing a digital cash system can be a major—and potentially painful—undertaking.

arrangements with financial research and reporting companies, such as Institutional Investor and Zacks Investment Research. Qpass, on the other hand, works with The Wall Street Journal Interactive, Morningstar and several other e-publishers. iPIN, a digital cash company located in San Francisco, has set payment arrangements with various music content providers, including MJuice.com, BuyMP3.com and Emusic.com.

Credit Crunch

Despite digital cash vendors' newly found faith in niche markets and micropayments, the industry's success remains far from assured. Only a handful of nonbusiness publishers have shown much interest in peddling their articles with the help of digital cash mechanisms. Online music sales, on the other hand, are threatened by the introduction of file distribution networks, such as Napster, which allow music fans to download tunes—albeit illegally—for nothing. And online gambling—a niche touted as a promising market for digital cash by Aberdeen's Rosall—remains a small market that's facing increasing pressure from U.S. regulators, most of whom would like to see the practice outlawed.

But even if micropayment strategies overcome these hurdles to blossom during the next few years, digital cash vendors won't necessarily be in the clear. The companies stand to face stiff competition from established credit card companies, which aren't likely to let a bunch of startups run away with a burgeoning industry. American Express, Visa and MasterCard are already experimenting with several

types of lower overhead electronic payment systems. Those projects could be accelerated if micropayments and other digital cash niche markets take off, says The Yankee Group's Pelino.

Telephone companies are also edging into the micropayments field, as smart phones and other mobile Internet access devices begin to arrive in shoppers' hands. Wireless technologies, such as WAP and Bluetooth, will soon enable shoppers to

charge online purchases directly to their phone bills. Several digital cash vendors, however, are looking to partner with phone companies to become the intermediaries that transfer charges between merchants and phone bills.

Rising Profiles

As digital cash becomes further integrated into the Internet payment process, the e-commerce community will find itself gradually adapting to the new technology, says Aberdeen's Rosall. Many products and services that are now free will come at a price. "Digital cash technologies will significantly impact the pricing and content models offered over the Web," she says. If that's true, then anyone who sells products on the Internet needs to pay attention. ■

PREDICTIONS optical networking

Optical Networking Arrives

THE RAPID INCURSION of optical network components will open up a range of new possibilities for corporations with large bandwidth demands, says Andrew McCormick, senior analyst for optical communications at Aberdeen Group and author of a recent report on the optical networking market.

According to McCormick, that worldwide market will grow from \$3.4 billion as of the end of 1999 to \$17.7 billion by the year 2003. The growth is starting with long-haul backbone products today, McCormick says, but it will quickly migrate to metropolitan area networks and—eventually—even to the desktop.

The growth of optical will give CIOs new options in how they deal with high-bandwidth requirements—both for long-term and short-term needs. With end-to-end optical networks in place, companies will be able to lease individual wavelengths of light along the fiber, providing them with OC48-class (2.45Gbps) speeds. But the nature of the network will let them lease these wavelengths on a much more cost-effective basis—for instance, leasing the line only for the duration of a worldwide teleconference.

Emerging standards in the market will also allow companies to quickly and easily switch providers, allowing them to constantly shop for the best price-performance available without getting locked in to a single provider long-term.

While the core technologies for these services exist today, McCormick says, don't expect them to appear overnight. Their widespread use may take another five years to materialize.

—Christopher Lindquist

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Telecommuting Comes Home

Far from a fading fad, remote workers have become mainstream

BY FRED HAPGOOD

IN THE '80s, the spread of networking inspired a handful of techno-enthusiasts to look a few steps down the road and predict an end to commuting, the collapse of the commercial real estate market, and a world where the idea of having two lives—one in which you worked and one in which you lived—became obsolete.

The reaction to these pipe dreams was immediate and severe. People, the skeptics said, needed to be away from the distractions of home. Managers needed to

muting in July 1991, when the tide of skepticism was near its height. From the tone of the piece, you can tell that we felt our audience had a negative bias. "Telecommuting, like Pittsburgh, is often unfairly dismissed..." we began. The essence of the piece was that even though telecommuting was generally thought of as a "frivolous work option for people who aren't serious about their jobs," there actually was hard evidence of productivity gains that needed to be considered.

Even so, we stopped far short of arguing that telecommuting was an easy-to-implement, natural workplace relationship.

Managers had to pick the telecommuting employees carefully and manage them in just the right way. But, we insisted, done right, it could be worth doing.

In retrospect we were far too conservative. Data from a number of studies suggest that the popu-

lation of telecommuters (typically defined as employees or independent contractors who work at home during normal business hours at least one day a month) has grown at an average rate of almost 20 percent a year, from 3.4 million in 1990 to 20 million (or 10 percent of the U.S. labor force) in 1999, and many analysts think that rate will continue to grow for years to come.

Where we went wrong was in buying

see employees at their desks. Telecommuting isolated people from the corporate culture—it took them "out of the loop." These arguments proved persuasive. "As recently as the mid-'90s, I could go to a conference and be the only person there presenting research on telecommuting," recalls Sumita Raghuram, a professor at Fordham Business School.

CIO published its own look at telecom-



new products

Keep a Close Watch

Web-enabled digital cameras are becoming ubiquitous: They monitor morning commutes, check out the waves at the world's surfing hot spots and even watch the goings-on in private homes for public entertainment. Now **Global Webnet** hopes to make Web cameras just another corporate tool. The company's DSLR-connected cameras house everything necessary for webcasting, including a processor, TCP/IP connectivity, video compression software and tools that let administrators control and monitor the cameras remotely. Global Webnet hosts the video distribution services on its own servers and can do custom development for individual applications. Global Webnet can also provide secure camera access, so only authorized users can view the transmitted images. Camera packages start at \$150 per month for customers. For more information, visit www.gwninc.com or call 213 252-7480.

More Sure Storage

Hewlett-Packard Co. has released the latest in its line of **SureStore E Tape Libraries**, the **6/140**. The automated drive library is available in four- or six-drive configurations capable of holding from 100 to 140 tapes. The library works under HP-UX, Sun Microsystems's Solaris and

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the assumption that telecommuting and ordinary work were two distinct options. In reality, there is a huge gray area of employees who are not at their desks eight hours a day no matter how they get to work. They are on call, or with a client, or on the road or somewhere else in the corporate domain. As networking appli-

Nortel Networks in Nashville is a good example. According to Mike Taylor, director of teleworking solutions at the company, more than 13 percent, or 10,000-plus, of the company's employees now work offsite (mostly from their homes). He expects that number to grow to 15,000 by the end of this year. While

As networking applications and access options became more powerful and widespread in the '90s, CIOs used company networks to reintegrate these "remote employees" into the corporate fabric.

cations and access options became more powerful and widespread in the '90s, CIOs used company networks to reintegrate these "remote employees" into the corporate fabric. As they did, these "teleworkers" and their managers learned how to use conference calls, e-mail and periodic office visits to keep in sufficient touch with each other.

These skills and attitudes were as compatible with telecommuting as any other mode of the emerging world of "virtual work." Indeed, a recent report from the New Jersey Institute of Technology found that many companies didn't even bother to keep track of the amount of telecommuting going on. "Since team members were often geographically dispersed anyway, telecommuting was not seen as a disrupter," the report said. It also suggested that companies interested in telecommuting ask around to see how much remote work is taking place without their knowledge. "Your organization may be further ahead than you think," the report concluded. In short, during the last decade telecommuting grew rapidly but informally, from the bottom up.

there are intrinsic reasons to support the transition (telecommuters register 35 percent higher on Nortel's measures of employee effectiveness, perhaps because they are not distracted by the office buzz). Taylor thinks the basic reason is that Nortel as a whole is evolving toward the paradigm of virtual human resources.

"You have to manage by results, not by observing behavior," Taylor says. Managers need to get weekly status reports. Communications, including mentor relations, require a deliberate structure. And while critical for a successful telecommuting program, Taylor thinks those same suggestions make for good management in any case.

Do it right, and the results can become obvious: Nortel's telecommuting program has already saved the company \$15 million in real estate costs, according to Taylor. And as the program continues to expand, those costs will keep dropping. "I have to wonder," he says, echoing our mid-'80s predictions, "just how much corporate real estate we are going to need." Perhaps the end of commuting will come yet. ■

new products

Microsoft Windows NT supports both SCSI and Fibre Channel connections. The unit uses HP's DLT 8000 drive technology and provides up to 5.6TB of storage. Customers can also upgrade the drives to more advanced HP technology at a later date. Pricing for the 6/140 starts at \$95,000. For more information, visit www.enterprisestorage.hp.com or call 800 637-7740.

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UNDER DEVELOPMENT fast-pattern processors

Network Bottleneck Breaker

MUCH-NEEDED HELP has arrived for voice and data networks straining under increasing demand for higher speeds and multiple protocols.

Agere, a network processor developer recently acquired by Lucent Technologies, offers a high-speed chip that's designed to break network bottlenecks. The Austin, Texas-based startup's Fast Pattern Processor (FPP) is the first network processor that can handle complex data, including Internet protocol (IP), asynchronous transfer mode (ATM) and several other protocols—at speeds of up to 2.5Gbps. “The device allows customers to move

packets 25 times faster than current programmable processor technology,” says Ford Tamer, Agere's former CEO, now general manager of Lucent's network processor group. “This ability to send packets at ‘wire speed’ means that packets don't have to be slowed down to direct them through the network.”

The programmable processor's applications include such tasks as routing, switching, network management, firewalls and monitoring. The device also lets carriers provide new service offerings—such as billing, load balancing, voice and video over IP, and virtual private network and

WAN services—via software changes rather than by replacing system hardware. “Our goal was to create a processor that offered maximum speed and flexibility,” says Tamer.

Network processors recently became a hot commodity, as the growth of the Internet and related technologies have forced carriers to explore new ways of keeping up with exploding customer demand. FPP will allow carriers to get more value out of their networks and allow them to offer customers important quality-of-service guarantees, says Andrew Cray, a senior analyst for telecommunications hardware at Aberdeen Group, a technology research company based in Boston. “Being able to identify and route critical application traffic at full speed is something that carriers really want to be able to do.”

While Agere has a head start in the network processor field, its lead may not last long. Both IBM and Intel are developing high-throughput chips that could equal or overtake Agere's FPP within a year or two. But Tamer isn't worried. “We're continuing our development and are moving forward.” Having access to Lucent's deep pockets and development resources isn't likely to hurt Agere's competitive position, says Cray.

“The FPP is available two ways: a 33MHz processor comes as part of a \$75,000 integrated development environment intended for design engineers. The 133MHz version is available in 100-unit quantities for \$750 each. Cray says the products are just starting to appear on the market, but their full impact won't be felt until next year. —John Edwards

Network processors recently became a hot commodity, as the growth of the Internet and related technologies has forced carriers to explore new ways of keeping up with exploding customer demand.



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CIO Confidential

Only the Names Have Been Changed

Dressing in the Dark

BY ANONYMOUS

THINGS NEVER GET SIMPLER.

Even the process of making something (anything) simpler inevitably makes that thing more complicated, less defined and more burdened with real and potential problems. The certain entropy of our business lives is not chaos by decay or disintegration, but chaos by layered ambiguity. A steady, inexorable decline marked not by a series of remarkable events but by a nearly frictionless downward spiral.

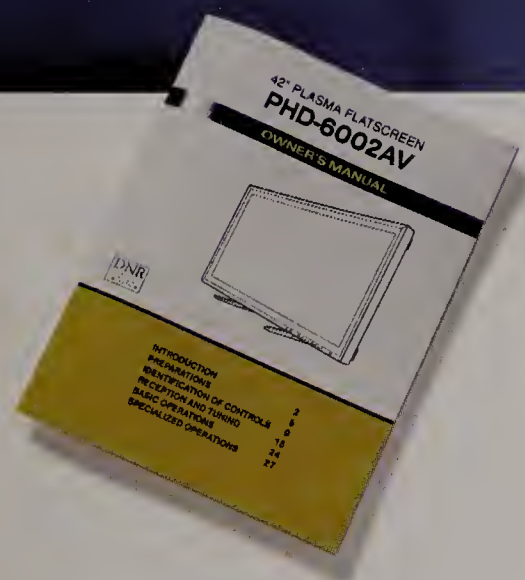
I was in Silicon Valley this past spring being escorted through the headquarters of a well-known hardware company. The view exiting the elevator was that all-too-familiar expanse of cubicles, precisely arranged to maximize available floor space.



Wear marks on the carpet confessed to at least two cubicle downsizings since the offices were occupied and made the placement of walls, conference rooms and coffee stations appear a lot more random than the original designers had intended. Working our way up one narrow aisle toward the CEO's cubicle (a pointless show of egalitarianism since the CEO is forced to spend most of his time in a conference room just to make a phone call), I caught out of the corner of my

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eye what appeared to be a very large woman with a ponytail and plaid skirt attempting to wrestle open the stuck paper tray of a copier. In desperation, the human combatant put one Nine West wedge against the side of the machine for leverage, revealing a moderately muscular, very hairy leg.

My first conclusion, that this must be an employee visiting from their offices in Paris, was proved incorrect when, suddenly aware of my presence, the broad shoulders turned to reveal a combination of moustache, horned-rimmed glasses and nose not unlike those novelty glasses we used to buy as kids that made us look like Groucho Marx. We stood and stared at each other for what seemed like 10 minutes, until my escort grabbed

far as the average worker is concerned, there isn't 5 percent worth of difference between any two established companies. Each spends a fortune on benchmark studies to make sure they're not paying employees a dime more than they have to, each squeezes workers into the smallest possible work space, and each pushes relentlessly on the productivity envelope while gassing about work/life balance. The casual workplace became a must-have, cost-free perk in the search for differentiation in the recruiting wars.

"Who needs child care and a cubicle bigger than a hamster cage? I get to wear Levi's to work!"

I miss the days of no decisions when it came to clothing. Like most men I know, I don't care that much about clothes, I don't have time to shop, and popular fashion is a complete mystery to me because I can't think of a single reason why, once set, fashions should ever have to change. In the good old days of charcoal gray business suits, they never did.

I ran across a fashion soul mate just last week when I spoke at a symposium for Fortune 500 CEOs concerning the impact the Internet and e-commerce would likely have on their businesses. It was a bitter disappointment to many in the audience to hear that the Internet was not the passing fad that they'd hoped it was. The event was being moderated by the president of one of the world's largest consulting firms, a tall, distinguished, white-haired gentleman (I'll call him Don) whose authoritative bearing makes him the center of attention even in a room filled with these leaders of American industry.

Don apparently packed two nearly identical pin-striped suits for this meeting, one blue and one gray, testament to both his station in life and his lack of imagination. For the most part, it's pretty hard to go wrong with suits like these: Just throw in a couple of white shirts and some red or blue ties and you're in business. Unfortunately, Don made the mistake that morning of dressing in the dark and, further, not bothering to check how he looked in the mirror before he walked out of the hotel. It can be pretty tough to deliver an important and powerful message when the audience can't take their eyes off your blue pants/gray jacket ensemble.

As I look around the office, it occurs to me that at least half the men (and more than just a few of the women) around here dress in the dark every single day. If I thought I could get away with it, I'd establish a whole new dress code whose purpose would be not to ensure conformity but rather to reduce the occurrence of hysterical blindness among those (myself included) who have to look at these getups. My rules might include the following:

Once upon a time, the rules of appropriate dress were as obvious as the biker tattoo on Stanley's forearm just above his charm bracelet.

my arm and pulled me along toward my appointment while sheepishly explaining that "Stanley," the person at the copy machine, was the most brilliant engineer the company had.

"Of course, I knew that," I thought to myself. "He would have to be."

I will always remember Stanley, not for his uncanny ability to mix styles, colors and textures for maximum heart-stopping effect or his willingness to defy the strictures of fashion by wearing knee-high nylons with a short skirt, but because he is obviously so valuable to his company that even the kryptonite of the HR department can't bring him into line.

Things only get more complicated.

You'd think something as benign as relaxing dress codes would have made things simpler. It didn't. Once upon a time, the rules of appropriate dress were as obvious as the biker tattoo on Stanley's forearm just above his charm bracelet. Even explaining fashion transgressions to the offending party used to be a pretty straightforward, unemotional exercise. Not anymore.

The fossil record of our evolution into this madness can be traced in the questions managers have to ask themselves in assessing a subordinate's presentability. We've gone from worrying about whether Fred has remembered to wear his lab coat to hoping that Fred's T-shirt doesn't contain any words that might contribute to a hostile work environment. We've gone from prescribing the length of Karen's skirt to hoping that she'll leave her nose ring at home.

It all would have been so much easier if we had relaxed dress codes for the right reasons. Alas, that didn't happen either. As



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Avoid wearing anything other people have to read, especially when both front and back have to be seen to get the joke. And, by the way, nobody will ever believe you got that Notre Dame Athletic Department T-shirt playing for the Fighting Irish—you're in IT, for Pete's sake.

Try to avoid wearing shirts the color of sherbet. They don't look good with anything.

Who needs child care and a cubicle bigger than a hamster cage? I get to wear Levi's to work!

If your jeans have more holes in them than Windows 2000, feel free to tear them into strips and use them to wax my car.

That can of Skoal chewing tobacco in your back pocket will leave a telltale circle in the fabric, so it's best to keep it in your shirt pocket. The same goes for the men.

Ties (on those rare occasions when you do wear one) should be long enough to reach your belt. If your expanding waistline is making your ties appear shorter, either buy some longer

ties or try slouching a little.

If you're feeling brave and/or desperate enough to try something this foolish, please feel free to use any part or all of my list.

At the same symposium where Don was doing his best GQ imitation, someone happened to mention that Scott McNealy of Sun Microsystems, Jack Welch's new best friend, recently attended his first General Electric board meeting wearing blue jeans and a polo shirt. In a room meant to impress, with richly paneled walls adorned with the portraits of GE heroes like Thomas Edison, our compatriot and school-yard bully, Scott, in a show of Rebel Without

a Clue bravado, decided that it wasn't enough to challenge convention, he needed to push it to the ground and take its lunch money.

Smooth move, Scott. Jeez! **CIO**

What if you could set the dress code at your company? Send your ideas to confidential@cio.com. Anonymous has been a CIO at household-name companies in various industries for over 12 years.

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It's impossible to know all there is to know about being a successful IT executive. Neither a newcomer nor a 20-year veteran has all the answers to mastering one of the hardest jobs in today's organizations. That's why there's a critical need for IT leadership mentoring and executive coaching. That need is especially great with a new generation of IT managers taking the reins as CIO and CTO. Meanwhile, veteran leaders can offer a treasure trove of hard-earned insights such as how to play the political game successfully and provide smart project leadership and the keys to motivating IT staff and managing user expectations.

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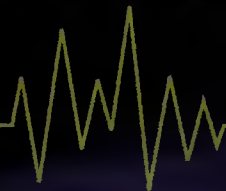
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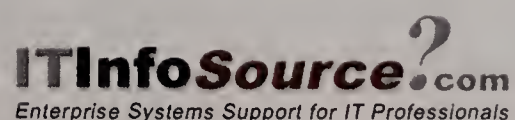
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The CIO as Coach

BY ERIC GOLDFARB

A CRISIS EXISTS in the management and implementation of IT. Many companies suffer because they do not have a solid understanding of how to identify and apply the best, most appropriate technology to garner an acceptable return on investment. Top IT management's ability to improve the bottom line is the single most important factor in determining whether a company sees IT as a success or a roadblock.

A major role of top information technology managers is setting, aligning and commingling IT vision with the company's overall business objectives. Many CIOs are content to link business and IT strategies by asking what the end user wants and building a list based on those wishes; this is doing little more than managing the objectives and following the business. Over time these managers stitch together an ad-hoc quilt of ill-conceived deliverables that does not yield effective results. While this type of "listening to the customer" is critical, it is not enough. The CIO needs to lead the business to the end results.

I am not advocating that IT managers ignore the end users and business executives. I am suggesting that the CIO's personal experience and analysis should help formulate a course of action.



End users should not dictate the IT group's agenda. Listening to and following what end users want are two different things. Listening is important as long as IT managers analyze what they have heard. Blindly following what end users say makes the CIO chase issue after issue without seeing the big picture.

With the end user calling the shots, a transformation may occur. The IT group becomes a service unit performing projects on demand for end users rather than being a company leader.

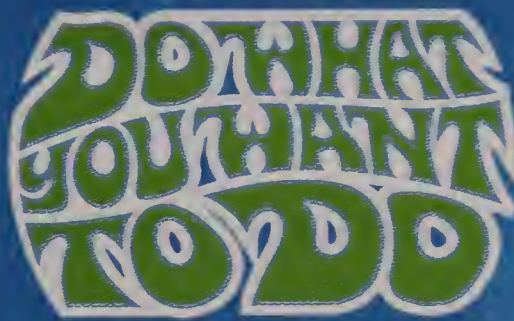
The following six guidelines can help IT management enhance a climate for success and focus on attaining results from IT, instead of merely following a laundry list of objectives from the business.

1. Know the business. The business skills of the CIO are critical in order to convey a sense of integrity and credibility to

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CEOs and their peers, who often feel ignorant and anxious about IT. The CIO should be a solid businessperson who is also an expert in applying technology to help a business make money.

2. Good enough can be best. Providing technical capability to an organization in excess of current expectations and needs can lead to excessive costs, elongate time to implement and hinder adoption by the organization. The pursuit of technical perfection by too many IT executives ignores the fact that there

Some of the most important technical decisions CIOs can make are the things that they will not do as opposed to the things they will do.

must be a trade-off among performance, cost and time. There are times when it may be better to optimize this trade-off, implementing a technology that is just good enough. Too often, possibilities for improving existing technologies are overlooked, and the difficulty of introducing a radically new technology is underestimated.

3. Do nothing. Some of the most important technical decisions CIOs can make are the things that they will not do as opposed to the things they will do.

4. Lead consensus. Widely shared opinions in the business units, even if wrong, can often shape the outcome of an IT effort. An implementation that defines its goals in technical

terms without regard for consensus of opinions may yield a failure.

5. Firm footing. Successful execution of vision depends primarily on the existence of the requisite IT infrastructure. The key question a CIO should ask is, Assuming the technology works, what stands in the way of the business adopting the tool? Often, infrastructure (training, help desk, adequate support) stands between a successful implementation and its adoption.

6. Commingle with the business. Move the application-development function closer to business operations. The extent to which application development resources penetrate business operations can vary. A corporate IT liaison might specialize in a business unit whose role is to set, shape and execute priorities for development projects. In another company, an IT liaison might move all the development resources into the user organizations and organize them under the users' direct or dotted-line control.

When asked the difference between a good coach and a bad coach, football legend Vince Lombardi answered, "The best coaches know what the end result looks like. If you don't know what the end result is supposed to look like, you cannot get there. The bad coaches don't know what the hell they want. The good coaches do." What holds true for good football coaches also holds true for good IT management. **CIO**

Eric Goldfarb is vice president, CIO and CTO at Macmillan USA in Indianapolis.

Culture Clash

BY WILLIAM F. ZACHMANN

I.T. CULTURES and the conflicts among them are sorely neglected aspects of the bigger picture in enterprise computing. It is crucial to recognize the role of IT cultures in order to see where corporate use of IT is and should be going. Many organizations will deliberately need to introduce IT culture change to ensure

effective information systems in the future.

There are different cultures (and subcultures) of IT professionals. These cultures can appear both across organizations and within them. Everyone would like to believe—and nearly everyone pretends—that technology decisions are based on objective assessment of alternatives. In truth, such decisions are often culturally influenced and culture bound, sometimes to the detriment of the organization as a whole.

Technology Bias

It is a rare individual who is culturally neutral. Most people have some sort of cultural, ethnic and religious background that, to some degree at least, influences their view of themselves and of their world. Similarly, nearly all IT professionals have some sort of cultural "roots" in one or another technology context. Ethnic and religious cultural backgrounds are unlikely to



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have any significant impact on technology decisions. The same cannot be said, however, of the technology-culture backgrounds of IT professionals.

Nearly every IT professional has a history linking him or her to specific technology cultures. Similarly, individual orga-

doomed to extinction but one that nevertheless is fighting hard to hang on where it can.

A sixth culture, an “underground” technology culture of sorts, is that specific to Cisco routers. This is really a specialist culture—one that in fact plays a very prominent role in IT infrastructures for many organizations.

There are other IT cultures, but these are the most important ones. The key to understanding their role and impact is to recognize that the overwhelming majority of IT professionals, one way or another, have their technology roots in one or two of these cultures and not in

the others. That goes for IT managers and CIOs just as much as it does for IT technical personnel.

Technology decisions made by even the best IT professionals are often going to be influenced by their cultural background.

nizations and, frequently units within large organizations too, have their own IT cultural histories.

Consider, for example, the once dominant culture of the IBM S360/370/390 mainframe environment. Like any other culture, it has its own special artifacts, languages, customs and practices that have evolved over time. But it also retains a great deal of continuity over time. It's a culture in which most programmers speak Cobol (with a minority who speak PL/1), where formerly IMS and now DB2 is the preferred way to handle large databases. Networking is (or at least was) spelled SNA.

A Host of Cultures

A very different culture is that of Unix. Originally part of the research lab and the university, Unix emerged in the 1980s as a vigorous alternative to the once plentiful and now nearly extinct commercial minicomputer cultures. Sun Microsystems took Unix out of the labs and into the business mainstream. In the Unix culture, programmers predominantly speak C and later C++. Networking is spelled TCP/IP. Unix has subcultures that proliferated; Linux is the most recent of these.

A third major IT culture is that of Microsoft Windows. This culture has emerged over the past decade, with Windows NT and now Windows 2000, to become a major cultural alternative for enterprise computing as a whole. In this culture, programmers speak C++ and Visual Basic. Networking was first spelled NetBIOS/Netbeui, but now TCP/IP. SQL 7.0 is the dominant database management system.

The fourth major culture today is that of the Internet. Programmers here speak HTML, XML and various scripting languages. Editors and designers join them. TCP/IP is taken for granted as the networking foundation. Database technology is drawn from all of the other cultures (Each of the first three cultures, of course, vies to make the culture of the Internet its own.)

A fifth culture, one that should be mentioned out of fairness, is that of Novell NetWare. This culture appears to be

Beware of the Familiar

It's all well and good to talk about concentrating on business solutions rather than technology, but in fact all business solutions need to rest on some specific technology—and not all technologies are equally efficient or effective. Nevertheless, human nature being what it is, it is a near certainty that the technology decisions made by even the best IT professionals are often going to be influenced by their cultural background.

It is not just old dogs that do not like to learn new tricks. Very often, young dogs do not like tackling new things, either! The psychologist Abraham Maslow long ago noted, “If the only tool you have is a hammer, you tend to treat everything as if it were a nail.” The essential principle Maslow expressed manifests itself in a tendency among IT professionals to prefer solutions familiar to them in whatever happens to be their own cultural background.

There is not necessarily anything wrong with this. Often it will be good policy to stick with what one knows in addressing new problems. There are, however, also plenty of times when this is not the best approach. That is why it is important for every organization to be aware of its own IT culture and that of its IT professionals and to ensure that decisions for future systems development are based on something more reliable than cultural bias. **CIO**

Do you have an opinion you would like to express? Let Senior Editor Megan Santosus know at santosus@cio.com.

As vice president of Meta Group, an IT research and consulting firm based in Stamford, Conn., William F. Zachmann covers middleware, software platforms, network operating systems and relational databases among other technologies.



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Opinion | Sound Off

Taking Sides on Critical Issues

Should IT Professionals Be in the Ethics Business?

BY MARTHA HELLER

THE JULY 1 Sound Off asked, “What should you do with illicit information you find on the job?” As usual, respondents were divided.

Some argued that IT professionals are citizens first, and as such they should contact legal authorities if they discover illegal activities. Others thought that IT workers should always let the issue drop after reporting it to their superiors. But the majority of respondents saw more gray than black and white. They suggested that their peers “examine their conscience” and “rest on their morals” to make “ethical judgment calls.”

But unlike doctors and psychiatrists, for whom ethics is an integral part of their training, IT professionals receive no formal ethical training at all.

That needs to change, says Leslie Ball, associate dean of IT at the Isenberg School of Management at the University of Massachusetts at Amherst. IT workers have the technical know-how to get close to sensitive data, so like it or not they are going to have to make judgment calls about what they find. “Ethical training should be a part of computer science curricula and corporate training programs,” he says.



Jeffrey Seglin, author of *The Good, the Bad, and Your Business: Choosing Right When Ethical Dilemmas Pull You Apart*, disagrees. (See interview with Jeff Seglin and book excerpt, Page 140.) “The idea that IT professionals are being asked to judge what is and isn’t sensitive data is nuts,” says Seglin. “Not because they’re not smart, but because it’s not their job.” Seglin would like to see ethical matters left up to human resources professionals, whose careers center around people, not computers.

So should IT workers be given the training to make ethical judgment calls, as are doctors, lawyers and HR professionals? Or should they turn all ethical judgments over to their colleagues in HR? Tell us what you think. Should IT professionals be in the ethics business?

This thread began online on April 19 and received a large amount of user interest and feedback. Here’s a sampling of the

ILLUSTRATION BY SUSAN SAAS



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comments and concerns I received. You can contact me by e-mail at mheller@cio.com, or you can reply to these and other Sound Off comments via the Web at comment.cio.com.

THE VERY NATURE OF COMPUTING AND TECHNOLOGY allows IT folks to become aware of information that might not otherwise be known. If the information is of a private or confidential nature, then the IT person must never disclose

WHAT DO YOU THINK?

Want to sound off on this or other topics? Join the ongoing debates at comment.cio.com.

what he or she has become aware of. If the information is of an illegal or immoral nature, then the IT person must always disclose it to a superior or other authority to deal with it.

The issue is quite simple, and IT folks have a responsibility, just like all other employees, to do the right thing. If any IT employee has a problem with that, then he should consider a career change.

Bruce Reirden

VP/CIO

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breirden@wihri.org

I.T. PROFESSIONALS DEFINITELY NEED TRAINING AND GUIDANCE in ethics. The nature of our business brings us in contact with sensitive information. In most cases, it is personnel and personal data that has no business going any further (for example, e-mail with salary data or a list of who's about to be fired). The IT team needs to know that they have a special responsibility to hold that information in confidence. In other cases, the information doesn't meet that criteria and needs to be handed over to appropriate management or company officials. It is not appropriate or acceptable to ignore that information.

John Murphy

Chief, IS Division

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THE ANSWER IS YES AND NO. BUSINESS ETHICS (CONTRACTS, customer relationships and so on), you bet. That's my professional relationship on the line as well as the customer's perception of my team as a business entity. Regarding being the "Information Cops"—no way!

First, we are too busy running the business. Second, the best

way in the world to lose your customer's confidence is to snitch them out. Leave it to the Potty Police!!

Steve Steinbrecher

CIO

Contra Costa County

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A FEW YEARS AGO, I.T. WASN'T IN THE CUSTOMER SUPPORT business. IT was systems, applications and infrastructure. Now, in our IT organization, every employee is getting customer service training. We all have customers. Similarly, every IT professional has the potential of coming into contact with sensitive data. The "It's not my job" mantra is unacceptable. IT professionals at all levels of the organization must be able to make the right decisions—even if that decision is to notify HR or the legal department. If IT is left in an ethical vacuum, how can they make the right decisions for their customers?

Camille Auspitz

Manager, Business of IT

Day & Zimmermann Group

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A LOT OF PEOPLE WOULD LIKE TO MAKE THIS ISSUE MUCH bigger than it really is. What qualifies as black and white or gray doesn't matter. Every person born and raised on this earth has been taught right from wrong and deep down can tell what is the right thing to do when faced with an ethical question. Regardless if you put a legal or accountability spin on it, deep down everybody knows and is personally accountable for their decisions regardless of the ramifications. In a nutshell, just by being human and a part of society we are in the ethics business.

Gary L. Figgins

CIO

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ETHICS IS BENEFICIAL ON MULTIPLE PLATFORMS. FROM understanding and respecting diverse cultures and emotions to speaking in a way that suppresses personal feelings during a heated conversation. Knowing what to say and how to say it can help build a strong team while giving you added respect.

Ethics are like freeware: Anyone can create his own version and claim that it is the best for a situation, when in reality ethics should be a standard. I strongly believe that ethics should be taught to everyone and that nobody is too young or too old to start understanding how he can affect people and situations.

Dino Karanikas

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The Benefits of Virtual Learning

IS AGE THE SOLE criteria for promotion within your company? Of course not. But it is in our country's public school system, where not much has changed in the past 100 years. Kids are subject to a ludicrous rationale at the end of a school year—all 8-year-olds leave the second grade and hear the words, "Congratulations, you are now promoted to the third grade." Some should be going to fifth grade. Others back to first.

Children, like employees, learn at dramatically different speeds. Yet the United States's education system, and probably your company's career-development program, treats them basically the same.

Though I am a strong advocate of the promise of technology in K-12 classrooms, the list of accomplishments created by the introduction of technology to the classroom over the past five years is a short one. Many more classrooms are connected to the Net, but few school districts really know what to do with this tool. Our industry, which has made its share of technology implementation mistakes, must share the blame for this.

It is easy for chief information officers, and people like myself, to critique our country's education system, claiming it is not producing enough IT workers. But what are we doing, really doing, about it?

The education process in the United States is one-dimensional. Teachers/instructors teach and students/employees learn. Some do it better than others. Technology has the



Gary J. Beach

power, however, to turn the paradigm—allowing teachers to learn and students to teach. But only the most leading-edge schools/companies have the guts to really jump in this pool.

Most are content to keep the status quo and view computers and network connections as the digital blackboard of the 21st century: just another set of tools to reinforce old ways of teaching and career development.

But computers and high-bandwidth network connections have the potential to turn our education system on its ear. My 17-year-old daughter, a junior in the local public high school, takes a course called Virtual High School offered at vhs.concord.org. We live in Massachusetts, but her teacher resides at the University of Michigan. Her fellow classmates—a.k.a. peer teachers—come from as far away as Singapore. And school doesn't end at 2:40 p.m. for this class. It is "virtually" 24/7.

The title on your business card may read "chief information officer," but in fact all readers of *CIO* are teachers. And you should start now to look at innovative ways you can leverage technology to help provide customized, individualized, career-based education programs for all of your company's employees.

In this real-time, just-in-time, just-for-me economy, relying on the old ways of career development just will not work. Smart, competitive companies will aggressively adopt innovative ways of e-learning to keep their organizations in leadership positions.

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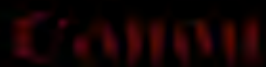
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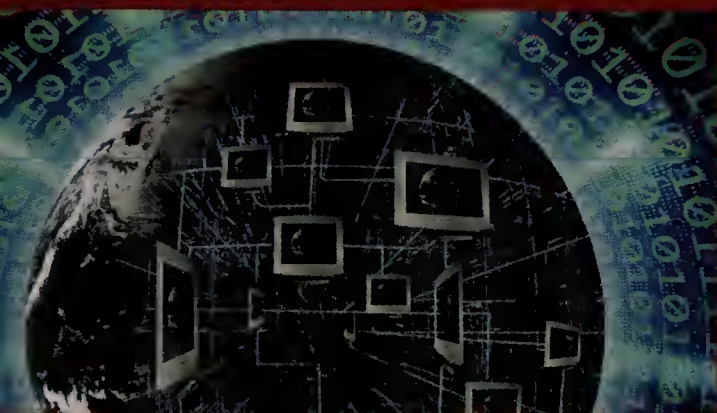
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Adviser Spotlight

Christopher Hoenig is Chairman and CEO of Exolve, a product and service company focused on the next generation of Web-based problem solving knowledge management tools. With degrees in hand from Yale, Cambridge and the Fletcher School of Law and Diplomacy, Hoenig traveled to Western Europe to cofound Transpotel BV, one of the first commercial online services to cater to the international road, rail, air and sea freight transportation industry. He later joined

consulting group McKinsey & Co., where he specialized in international management and information technology strategy. His next appointment was as director of information management and technology issues at the U.S. General Accounting Office, where he was responsible for overseeing the government's expenditure of \$25 billion on information technology.

His most recent post is with Washington, D.C.-based Exolve, a company he cofounded. Hoenig's company tackles today's business challenges, such as growing businesses, taking over new

markets or developing new technologies.

Hoenig values these three fundamental truths for organizations: Knowledge is a strategic asset, technology is our key tool and problem solving is a paramount skill. Knowledge management is not going to get to the next level until it is possible to provide the right knowledge at the right time at every step of a specific problem-solving process, whether it's building a system or a product. "Once you can deliver knowledge in context, then you can get your organization to a completely different level," Hoenig says.

One of Exolve's clients is the CIO's organization at the Department of Defense (DoD), which is building a Web-based problem-solving portal that will eventually serve 154,000 DoD IS personnel worldwide. Says Hoenig, "We are tackling a core issue for American business and the technology industry in general—delivering value from technology. There are a lot of technology products out there that were not designed with the problem solver on the other side of the screen in mind."

After almost two decades of research, Hoenig has distilled his knowledge into a book, *The Problem Solving Journey: Your Guide to Making Decisions and Getting Results*, to be published by Perseus Books in the fall of 2000.

—Lisa Kerber

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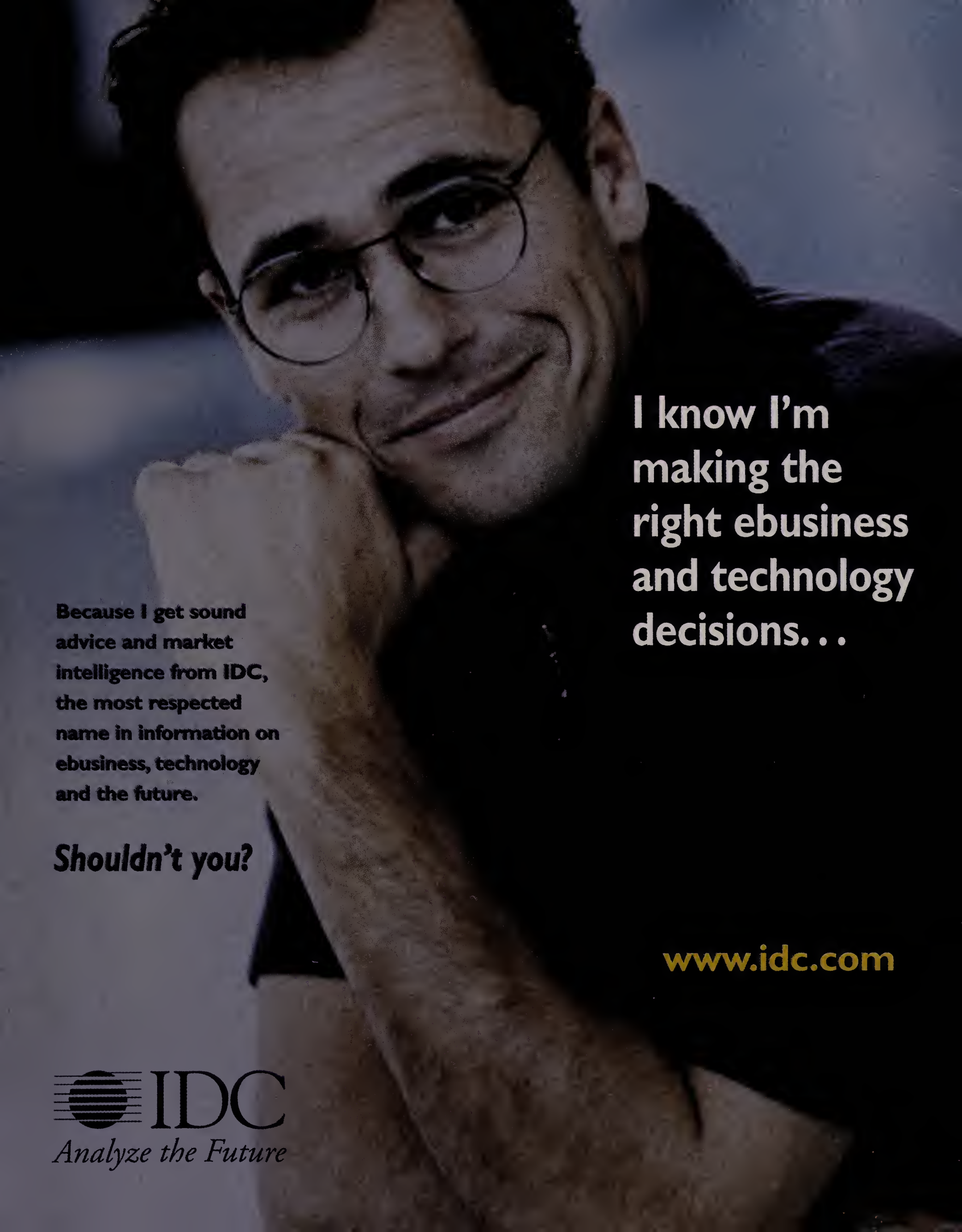
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Time Piece

Let It Slide

MY FATHER bought this Post VersaLog slide rule for \$22 back in 1959. At the time, his tuition at the City College of New York was \$14.50 a semester, so the purchase was a significant one. To keep it in top condition, he would tune the instrument every few months, aligning the front and back hairlines with the top and bottom fixed rules, and cleaning the grooves to allow it to slide more easily.

The English mathematician William Oughtred is widely credited with inventing the slide rule, somewhere around 1630,

though his work was inspired by John Napier, a Scot who in 1614 showed that by adding and subtracting logarithms, one could multiply and divide numbers. The modern slide rule, if handled correctly, can be used to multiply and divide, calculate logarithms and trigonometric functions, and figure out roots and powers. Engineers used them to build bridges, astronauts brought them on space missions, and

students relied on them to pass even the toughest math and science exams. Despite its versatility, the slide rule fell out of favor in the 1970s (credit the pocket calculator), though in some circles it is still collected and even revered.

For the record, my father swears he never hung the slide rule's long leather case from his belt. Only nerds did that.

—Sara Shay





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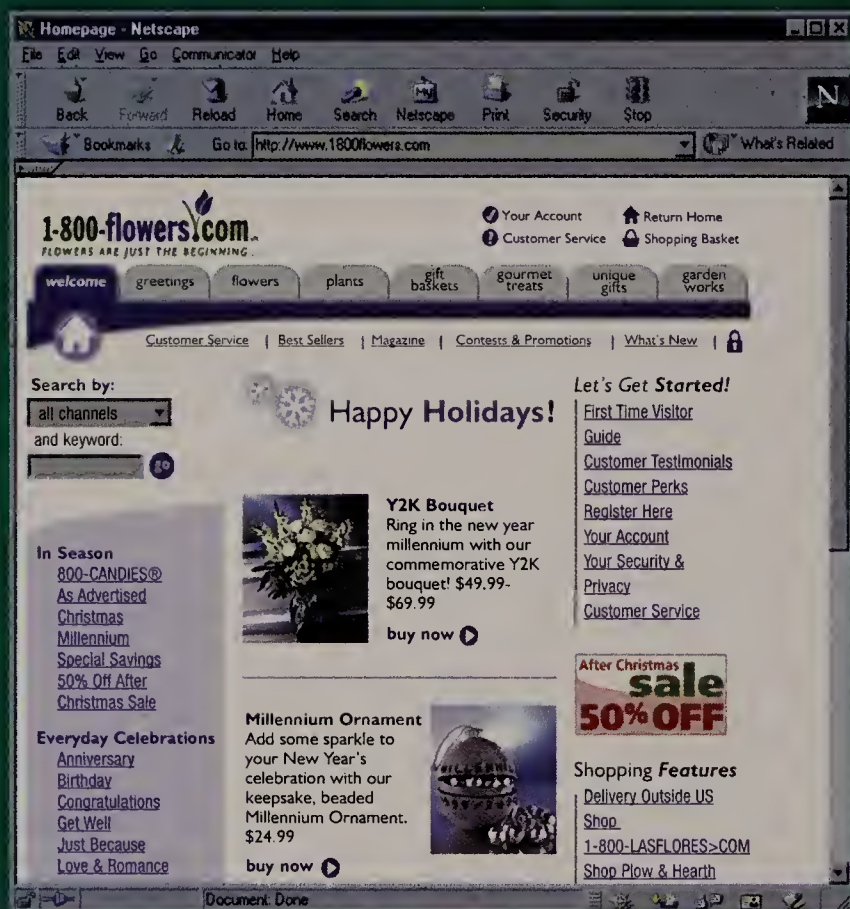
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